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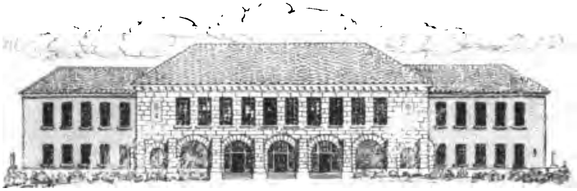

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ARITHMETIC BY GRADES

FOR INDUCTIVE TEACHING, DRILLING AND TESTING

BOOK NUMBER FOUR

Whole Numbers Unlimited, Common Fractions to Twelfths, Decimal Fractions to Thousandths, Measurements, Business Transactions, Denominate Numbers

DEPARTMENT OF EDUCATION
LELAND STANFORD JUNIOR UNIVERSITY

PREPARED UNDER THE DIRECTION OF
JOHN T. PRINCE

BOSTON, U.S.A.
GINN & COMPANY, PUBLISHERS
1899

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NOTE TO TEACHERS.

THE attention of teachers is called to the following features of this series of books — features which should be kept in mind as the various subjects are presented.

1. The separation of teachers' and pupils' books, whereby pupils may be taught properly and may not be given too great assistance. Suggestions as to methods of teaching and drilling, as well as the illustrative processes, explanations, rules, and definitions which belong to the teacher to develop analytically are put into the Teachers' Manual, while in the pupils' books are presented only such exercises as are needed for practice.

2. The careful gradation of problems, by which pupils acquire inductively a knowledge of arithmetical relations and principles, and skill in arithmetical processes. This is in recognition of the well-known pedagogical principles of proceeding from the known to the unknown, and from the simple to the complex. It is advised that this plan be kept constantly in mind by the teacher, and that whenever a process is not understood or is not readily performed, the pupils should be taken back to processes which are well known and which can be performed readily, and then should be led forward by easy steps until the desired end is reached.

3. Frequent reviews, and such an arrangement of exercises as will enable pupils to have needed practice in the applications of each principle, first by itself, and afterwards in connection with other principles which have been learned.

4. The large amount of oral work, or work which may be done without the aid of figures. Three objects of Mental Arithmetic are sought in these exercises : (*a*) Illustration of principles and a preparation for written work, (*b*) Development of the logical powers, (*c*) Cultivation of ability to work with large numbers by short processes.

5. The great number and variety of problems. The aim has been to give the *largest number* of problems that will be needed for teaching and for drilling in all grades. For this reason, and because the forms of expression are varied, being taken from many sources, there will be no necessity of giving supplementary drill lessons on the blackboard. Blackboard lessons are objectionable not only on account of a waste of the teachers' time and strength, but also on account of the injury done to pupils' eyes in much reading and copying from the blackboard.

6. Practicalness of work in respect to the character of the problems, and the solution of them. Care has been taken to give problems which are most likely to be met in every-day life, and to give them in a practical form. Many of the miscellaneous review problems were made by mechanics, clerks, accountants, etc., with a view of presenting conditions most likely to occur.

7. The introduction of statistics and facts of physics, astronomy, history, geography, etc., thus enabling pupils to gain incidentally much useful information.

8. The use of drill tables and other devices to save the time of teachers.

In addition to the above features, some of which are distinctively new so far as American text-books are concerned, there is the separation of pupils' exercises for practice into small books somewhat on the lines of gradation in City graded schools. By this arrangement there are gained greater convenience of handling and economy of wear than in the use of a large book which is intended to be used for several years by the same pupil.

The first section of this book is given to a review of some work included in Book No. 3. If these exercises are found too difficult for pupils, it would be well for them to review such parts of Book No. 3 as are most needed.

If the pupils have not a thorough knowledge of the relations and operations of numbers to millions gained by the use of objects, it is quite important that such knowledge be acquired before Section II. is begun.

Development exercises with splints, etc., such as are presented in Book No. 3, should be persistently given for several weeks before figures independent of objects are dealt with.

In teaching common fractions to twelfths and in much of the drill work, the use of disks is strongly advised. Drawings also by circles, lines, squares, etc., should be constantly encouraged.

The use of the paper or cardboard square cut into strips, small squares, etc., should he insisted upon until a good idea of the relations and operations of decimals to thousandths is gained.

Besides the apparatus above suggested, there should be constantly at hand the various measures of length and capacity such as the foot rule, yard stick, quart, peck, gallon, etc.

For other suggestions and directions in using this book and for answers to problems, teachers are referred to the Manual for teachers which is designed to accompany all books of the series.

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SECTION I.

Oral Review Exercises.

1. Add: $6+8+5+9+7+4+8+3+9+6+4+3$.
2. Add: $14+15$; $21+18$; $67+12$; $32+17$.
3. Add: $38+22$; $64+26$; $37+23$; $48+22$.
4. Add: $49+30$; $27+33$; $43+38$; $52+39$.
5. Add: $54+41$; $63+45$; $48+43$; $66+43$.
6. Add: $38+39$; $46+58$; $64+38$; $58+42$.
7. From 100 take: 17; 29; 36; 14; 46; 58; 72.
8. From 100 take: 28; 36; 19; 38; 56; 43; 69.
9. Subtract: $90-20$; $94-23$; $86-26$; $57-18$.
10. Subtract: $82-33$; $46-27$; $62-38$; $58-29$.
11. Subtract: $91-64$; $83-46$; $54-36$; $78-39$.
12. Multiply: 12×4; 15×4; 16×3; 18×4; 17×5.
13. Multiply: 15×6; 18×6; 16×7; 15×7; 19×6.
14. Multiply: 18×8; 16×9; 17×9; 19×8; 14×9.
15. Multiply: 21×4; 26×3; 28×4; 28×6; 27×8.
16. Multiply: 36×2; 29×3; 24×3; 48×2; 28×3.
17. Divide: $84\div7$; $39\div13$; $52\div13$; $64\div16$; $96\div16$.
18. Divide: $85\div5$; $63\div3$; $84\div4$; $72\div6$; $96\div4$.
19. Divide: $75\div6$; $83\div6$; $94\div8$; $89\div7$; $93\div3$.
20. Divide: $84\div15$; $96\div18$; $76\div14$; $83\div19$; $68\div15$.
21. Divide: $97\div12$; $78\div15$; $81\div18$; $93\div14$; $74\div19$.
22. Divide: $82\div3$; $69\div4$; $71\div3$; $96\div5$; $99\div6$.
23. Divide: $69\div4$; $83\div6$; $56\div16$; $87\div13$; $79\div18$.
24. Divide: $59\div14$; $73\div17$; $84\div19$; $94\div18$; $99\div19$.

1. $80 \div (16 - 12) - 8 + 14 - 18 \times (26 - 8) = ?$

2. $27 + 34 + 16 + 13 \div (37 - 28) \times (16 + 8) = ?$

3. $3\frac{1}{2} \times 6 + 34 - 27 - 14 \times 8 - 50 = ?$

4. $\$8.30 - \$4.80 + \$0.75 - \$1.25 - \$2.50 = ?$

5. $\$1.50 - \$.70 + \$3.70 - \$2.80 + \$1.20 - \$0.60 = ?$

6. $(74 - 18 + 16) \div (38 - 29) \times (16 - 5) = ?$

7. $100 - 45 + 135 - 65 - 55 + 245 = ?$

8. From 200 take each of the following numbers: 45, 65, 24, 36, 72, 58, 33, 79, 142, 181, 78, 15, 118, 67, 28.

9. At $1¼ a yd., what will 8 yd. of cloth cost? 12 yd.? 16 yd.? 20 yd.? 40 yd.?

10. How many days in the months of July, August, and September? How many weeks?

11. How many pounds of sugar at 6 ¢ a pound can I buy for 3 dozen eggs at 18 ¢ a dozen?

12. If 8 lb. of meat cost 44 ¢, one pound will cost — ¢, and 6 lb. will cost — ¢.

13. There are 24 sheets in a quire. In 4 quires there are — sheets.

14. At 12 ¢ a gal., 2⅔ gal. of oil will cost — cents.

15. At the rate of 20 lb. for a dollar, 4 lb. will cost — cents.

16. At 3 ¢ a pt., what will 2 gal. of milk cost?

17. John picked 3 qt. of berries, and James picked 1¼ pk. How many quarts did both pick?

18. At the rate of 2 apples for 3 ¢, how many apples can you buy for 12 ¢?

19. I buy 8½ lb. of meat at 12 ¢ a pound, and give in payment a two-dollar bill. What change should I receive?

1. At the rate of 3 apples for 2 ¢, how much will 12 apples cost?

2. If 3 bbl. of flour cost $15, what will 2 bbl. cost?

3. A man began work at 8.30 A. M., and worked until 2 P. M. What did he earn at the rate of 20 ¢ an hour?

4. If the telegraph rates from New York to Chicago are 30 ¢ for ten words, and 2 ¢ for each additional word, how much would it cost to send this problem?

5. If the cable rates from New York to Vienna are 36 ¢ for each word, how much would it cost to send the following message: "Jameson — Send four hundred Genoa — Smith"?

6. What will 2 quires of paper cost at ½ ¢ a sheet?

7. What will a ream of paper cost at 8 ¢ a quire? at ¼ ¢ a sheet?

8. What will 2 gal. 3 qt. of oil cost at 16 ¢ a gallon?

9. Find the cost of 3 pecks of corn at 60 ¢ a bushel.

10. How many gill cupfuls of milk in a gallon?

11. 80 ¢ was paid for 4 qt. of berries. At the same rate, what should be paid for half a bushel?

12. Mr. Brown's horse is 15 hands high. If a hand is 4 inches, how many feet high is the horse?

13. A man earns $120 in 3 months. At that rate how much will he earn in a year? in a day, counting 25 working days in the month?

14. What will 4¼ lb. of meat cost at 16 ¢ a pound?

15. In a school of 48 pupils, one-fourth are boys. How many more girls than boys in the school?

16. What will 5 bu. 1 pk. of wheat cost at 60 ¢ a bushel?

1. In 53 pints, how many gallons, quarts, and pints?

2. One-quarter of a ton is how many pounds?

3. How many posts one rod apart will it take to extend a mile?

4. At 2½¢ a mile, how much will it cost to ride in the cars to some city within 200 miles of where you live?

5. At 12¢ a pound, what will 4 lb. 4 oz. of cheese cost?

6. How many kegs of nails, each keg weighing 100 lb., will it take to weigh 2½ tons?

7. A cargo of flour, weighing 2 tons, consists of how many barrels, each barrel weighing 200 lbs.?

8. At ½¢ an ounce, what will be the postage on a package weighing ¼ of a pound?

9. How much should I pay for 3 qt. of berries at the rate of $1.20 a peck?

10. What will 3500 lb. of coal cost at $6 a ton?

11. What will 3 bu. 2 qt. of grain cost at 16¢ a peck?

12. At the rate of 3 apples for 2¢, what will a dozen apples cost? How many apples can I buy for 10 cents?

13. How many cows at $40 can be bought for $800?

14. How many inches in one-fourth of a yard?

15. If a barrel of vinegar contains 31½ gal., what can I sell it for at 10¢ a quart?

16. How many dozen eggs are 18 eggs? 42 eggs? 66 eggs?

17. What will 18 eggs cost at 20¢ a dozen?

18. What will 30 eggs cost at 30¢ a dozen?

19. John finds there are 360 paces from his house to the post office. If his paces are 2¼ ft. long, how many feet is it? How many yards?

1. How many square feet in the floor of a room 20½ ft. long, 16 ft. wide?

2. How many square feet in a garden 20 yd. long and 20 ft. wide?

3. What will 9 lb. of tea cost at 67¢ a pound?

4. 8 oranges cost 24¢. At that rate what will 2½ doz. cost? 4¾ doz.?

5. 6 lb. of coffee cost $2.28. At that rate what will 2 lb. cost? 10 lb.? 8 lb.?

6. If my hens lay on an average 8 eggs a day from June 20 to August 1, inclusive, and I use in that time 2 dozen, how many do I sell? What do they sell for at 20¢ a dozen?

7. In an orchard there are 18 rows and 12 trees in a row. How many trees in the orchard? If the trees are 20 ft. apart, and the rows begin and end on the border line of the orchard, how long and wide is the lot of land? How many feet of fencing will it take to fence it on all sides?

8. A newsboy sells during one week 180 one-cent papers, 148 two-cent papers, and 66 three-cent papers. How many papers does he sell in all? How much money does he receive? If he makes ¼¢ on each one-cent paper, ½¢ on each two-cent paper, and 1¢ on each three-cent paper, what are his profits for the week?

9. How many dozen eggs at 30¢ a dozen, will pay for 6 yards of cloth, at 15¢ a yard?

10. A farmer buys at the store 15 lb. of sugar at 8¢ a pound, and pays for it with 3 bu. of potatoes. How much was allowed for the potatoes per bushel?

1. A man bought 8 cows for $300, and sells them for $45 apiece. How much did he gain?

2. If I buy 6 dozen eggs for 80¢, how much must I sell them for a dozen to gain 10 cents?

3. 4 dozen apples are worth how many times as much as 6 apples? How many times as much as 1⅓ doz.?

4. If 6 bushels of oats are worth 4 bushels of corn, how many bushels of corn are worth 18 bushels of oats?

5. At the rate of 15 miles in 5 hours, how many miles would a man walk in 8 hours? How long would it take him to walk 12 miles?

6. If I buy 13 lb. of butter at 32¢ a pound, and give a ten-dollar bill, how much change do I receive?

7. I bought 12½ lb. of prunes at 18¢ a pound, and a bottle of olives for 35 cents. I gave the clerk a five-dollar bill. What change did I receive?

8. I bought 3 lb. of meat at 14¢ a pound, and — gal. of oil at — ¢ a gallon, giving the storekeeper a five-dollar bill. What change did I receive?

Find the price of the following articles, and write problems about them:

9. Buying molasses and sugar with $2.
10. Buying matches and salt with $1.
11. Buying meat and potatoes with $5.
12. Buying coffee and tea with $2.
13. Buying chicken and steak with $5.
14. Buying fruit — two kinds — with $1.
15. Buying flour and coal with $10.
16. Buying cloth and shoes with $10.

1. I bought 8 lb. of beef at 15¢ a pound; gave a two-dollar bill. What change?

2. I bought 6 lb. of sugar at 7¢ a pound, and 12 oranges at 2¢ apiece; gave a dollar bill. What change?

3. I bought 8 lb. of rice @ 9¢, and 3 lb. of butter @ 30¢; gave a two-dollar bill. What change?

4. At $6.40 a ton, what will 1000 lb. cost? 3 T.? 500 lb.? 8 cwt.? 2500 lb.?

5. How many 8-oz. packages can be made from 3½ lb. of nails? from 7 lb. 4 oz.?

6. How many yards of fence will it take to inclose a lot 60 ft. long and 45 ft. wide?

7. How many square inches in the top of a desk 2 ft. long, 9 in. wide?

8. At 7¢ a square foot, what will it cost to make a floor 12 ft. long and 8½ ft. wide?

9. What will 9 baskets of peaches cost at $1.42 a basket?

10. Make up problems about 2 lb. coffee @ 36¢; 2 lb. tea @ 65¢; 12 lb. sugar @ 8¢; 9 yd. cloth @ 12¢; molasses at 45¢; 8 lb. fish at 9¢; 3 lb. butter at 35¢; for which you give a one, two, or five-dollar bill. State amount of change received in each case.

11. 4 eggs cost 10 cents. What can you say about 20 cents? about a dozen eggs? about 5 dozen eggs?

12. A boy can saw ½ a cord of wood in a day. What can you say about 1 cord? about 6 days?

13. Make problems, using the following operations: 12×4; 16×9; $100 - 76$; $80 \div 5$; $28 + 36$; $(6 \times 8) + (9 \times 12)$; $100 \div 20$; 18×6; $200 - 130$; $100 - (6 \times 12)$; $84 + 38$.

Written Review Exercises.

Add :

1.	2.	3.	4.
$2.85	$9.87	$127.04	$74.83
16.07	419.63	16.69	108.47
15.92	7.42	209.80	83.96
106.50	106.07	450.83	450.90
72.87	18.49	74.32	86.08
.93	9.96	1.96	78.07
80.68	8.54	.56	283.80
7.49	63.40	18.00	69.69

5.	6.	7.	8.
$48.06	$4075.39	$748.65	$456.56
280.37	486.08	837.42	881.97
106.74	78.93	78.63	763.78
45.95	100.72	46.29	295.00
50.09	59.76	529.74	978.49
100.07	398.54	85.58	332.85
75.94	30.07	843.95	597.65
386.57	987.65	85.72	424.86
98.55	86.54	37.85	949.97

Add the following as they stand :

9. 8484, 8623, 7294, 7864, 5329, 2794, 3826.
10. 2368, 489, 76,843, 4382, 786, 89,728.
11. $280.68, $784.29, $294.64, $387.28, $786.94.
12. $960.48, $27.48, $384.08, $29.72, $864.35.
13. $838.64, $276.42, $69.07, $308.60, $72.39.
14. $96.38, $309.70, $29.20, $648.00, $809.06.

1. How much more will 186 bbl. of flour cost at $5.40 a barrel than 1260 bu. of wheat at 75¢ a bushel?

2. Find the cost of 100,000 lb. of coal at $6.34 a ton.

3. A merchant's profits for a year were $6,428.40. How much did he gain in 1 month? How much in 1 day, counting 26 trading days in a month?

4. Counting 365 days in a year, how much would a man spend for cigars in 6 years, if he smoked 6 five-cent cigars every day?

Find the cost of

5. 64 barrels of flour at $5.25 a barrel.

6. 68 bushels of wheat at $ .85 a bushel.

7. 34 tons of coal at $5.75 a ton.

8. 1850 pounds of ice at 28¢ a cwt.

9. 850 pounds of wheat at $1.12 a cwt.

10. 1 cwt. of ice at $4.80 a ton.

11. 800 pounds of ice at ¼¢ a pound.

12. 27 barrels of apples at $2.25 a barrel.

13. 850 pounds of sugar at $6.40 a cwt.

14. How many barrels of oil at $5 a barrel will pay for 860 lb. of sugar at 5½¢ a pound?

15. A farmer sells a merchant 86 bu. potatoes at $ .65, 164 lb. of butter at $ .32, and 212 doz. eggs at $ .22. The merchant sells the farmer 12 lb. of tea at $ .56, 3 bbl. of flour at $5.75, and 18 yd. of cloth at $ .87. Which person owes, and how much?

16. If a horse eats 8 lb. of hay a day, how many pounds will be needed for a year of 365 days? How many tons and pounds?

1. How many square feet in a piece of land 186 ft. long, 135 ft. wide?

2. How many feet around a rectangular lot 8 yards long, 4 rods wide?

3. How many square feet in a lot of land 200 ft. long, 4 rods wide? How many square yards?

4. What will 82 kegs of nails cost at the rate of 8½ ¢ a pound, each keg weighing 100 lb.?

5. What will 18½ doz. lemons cost at $2.50 a hundred?

6. A man has in the morning $112.60 in his pocket-book, and spends the following sums: $2.24, $6.38; $20.40, $17.34. What sum ought he to have at night?

7. A merchant buys 84 reams of paper at $2.60 a ream. He sells it at 15 ¢ a quire. What was the gain?

Add the following ledger columns:

8.	**9.**	**10.**	**11.**
$64.08	$80.63	$7.27	$127.50
6.39	17.09	15.87	28.09
42.63	214.38	634.38	464.56
236.42	3.27	7.69	7.65
87.45	.65	.78	75.83
6.93	43.16	.49	359.77
386.74	6.95	68.37	28.90
24.08	124.39	9.86	682.18
78.96	68.36	106.74	3.09
80.63	329.74	83.27	96.35
483.75	76.85	97.78	91.24
57.61	8.52	39.43	5.34
6.24	7.35	8.18	6.79

Find :

1. $\frac{1}{8}$ of 68,640
2. $\frac{1}{9}$ of 23,670
3. $\frac{4}{9}$ of 23,670
4. $\frac{5}{8}$ of 68,640
5. $\frac{5}{8}$ of 70,600
6. $\frac{1}{7}$ of 36,050
7. $\frac{6}{7}$ of 36,050
8. $\frac{8}{9}$ of 32,067
9. $\frac{1}{24}$ of 83,600
10. $\frac{1}{18}$ of 70,452
11. $\frac{1}{54}$ of 68,310
12. $\frac{1}{34}$ of 12,512

13. If a man saves $35 a month, how many years and months will it take him to save $2870 ?

14. $157.95 was divided among some workmen, giving each man 65 ¢. How many workmen ?

15. If 124 bags of coffee, each weighing 45 pounds, cost $1953, what is the cost of one pound ?

16. How many bushels of potatoes at 65 ¢ a bushel, will pay for 48 yd. of cloth at $1.30 a yard ?

17. I bought 450 lb. of sugar at 6½ ¢ a pound, and 17 bbl. flour at $6.25 a barrel. I gave in payment two one-hundred-dollar bills. What change should I receive ?

18. I bought 18 pieces of cloth, each containing 42 yd., at 16 ¢ a yard ; paid for it in butter at 21 ¢ a pound. How many pounds did I give ?

19. A wheat merchant bought 684 bushels of wheat for $590, and sold it at 96 ¢ a bushel. What was the gain ?

20. In a factory there are 62 men employed at $1.75 a day, and 15 men at $2.25 a day. The other expenses are $142 a day. How much does it cost to keep the factory going a month of 26 days ?

21. A barrel of vinegar containing 37 gallons was bought for $7.40 and sold for 8 ¢ a quart. What was the gain ?

1. A man had $148.60 in the bank, January 1, and deposited $46.50 and $75.00 during the month. He used checks as follows: $4.80, $15.60, $38.40, $74.20, $13.40. What was the balance February 1?

2. How many yards of double line telephone wire will it take to connect two places 5 miles apart?

3. A car-load of oats (620 bushels) was bought for $175 and sold for 37¢ a bushel. What was the profit?

4. The wheel of a bicycle measures 11 ft. in circumference. How many times will it turn going 100 rods? In going 2 miles?

5. How long will it take you to count half a million, if you count at the rate of 100 a minute?

6. How many days will it take a man to walk 1000 miles, if he walks 3 miles an hour, 6 hours a day?

7. Find as nearly as you can by the scale or meridians the distance across this country from San Francisco, Cal., to Richmond, Va., and tell the number of days it would take the man spoken of in the last example to walk that distance.

8. Make and perform a problem about buying oats at 55¢ a bushel, and selling them at 60¢ a bushel.

9. Make and perform a problem about some distances you have measured by pacing.

Write and perform problems involving the following operations:

10. $(125 + 643 + 728) - 1229$.

11. $\overline{45 \times 16} + \overline{38 \times 19}$; $1000 - \overline{84 \times 9}$.

12. $\overline{837 + 1044} \div 9$; $3000 - \overline{486 + 539}$.

13. $5000 - (38 + 246 + 384)$; $\$585 \div \$25$.

SECTION II.

Integers above Millions.

1. In writing the number one hundred twenty-three, what figure is put in the first or units' place? What in the tens' place? What in the hundreds' place? These places are called orders, and all three orders together are called the period of units. Name the orders and period in the numbers

426 309 720

2. The fourth place or order is called ones of thousands, the fifth order is called tens of thousands, the sixth order is called hundreds of thousands, and all three of these orders are called the period of thousands. Name the periods and orders in the numbers

964,386 783,942 965,327

3. How many ones make a ten? How many tens make a hundred? How many hundreds make a thousand? How many of any order make one of the next higher? How many hundreds of thousands make one million? Write one million. Write one hundred million.

4. The third period is called the millions period; the fourth period of three places is called billions; the fifth period, trillions. Name the periods and orders in:

1.234,567 84,748,963 486,394,729

1. Read the following numbers :

PERIODS.	Sixth. Quadrillions.			Fifth. Trillions.			Fourth. Billions.			Third. Millions.			Second. Thousands.			First. Units.		
ORDERS.	Hundreds of	Tens of	Ones of	Hundreds of	Tens of	Ones of	Hundreds of	Tens of	Ones of	Hundreds of	Tens of	Ones of	Hundreds of	Tens of	Ones of	Hundreds of	Tens of	Ones of
	8	5	4,	6	7	3,	1	2	3,	9	5	4,	7	6	2,	3	5	4.
		7	6,	8	3	9,	7	0	4,	3	2	1,	7	6	0,	8	3	0.
			9,	6	3	0,	0	7	4,	3	9	7,	2	0	3,	7	6	9.
		4	0,	6	9	7,	3	8	4,	0	7	6,	8	9	0,	0	7	6.
				8	0	7,	0	0	0,	7	6	9,	3	9	0,	0	0	7.
			9,	0	3	4,	6	9	0,	0	0	7,	5	8	3,	0	0	0.
	7	0	6,	9	3	0,	0	8	0,	7	0	0,	0	0	1,	8	0	3.

2. Name the orders of the units' period; of the millions' period; of the trillions' period; of the thousands' period. Read all the above numbers of the thousands' period; all of the quadrillions' period; all of the billions' period.

3. Point off and read the following numbers :

8096 60973 608974 8693485 6809743
869743074 8307463 5863974042 897432974

4. Write the following :

a. Seven million. *b.* Eighty-four million two hundred sixty-five thousand. *c.* Six hundred five million. *d.* Eight billion seven hundred sixty million ninety thousand two hundred sixty-five. *e.* Ninety million seven thousand four hundred. *f.* Seventy quadrillion forty million thirty thousand one hundred fifty.

1. Add four million thirty thousand four hundred six, three hundred thousand seventy, eighty thousand four hundred four, twenty-seven thousand forty.

2. Add 3,071,070, 600,748, 79,008, 360,078, 40,609,097, 3,069, 78,603.

3. Add seven thousand sixty, eighty-nine thousand four hundred nine, two million eighty thousand, nine hundred forty, seven hundred seventy thousand sixty, ninety-five thousand seventy-four, three hundred six thousand four hundred nine.

Find the sums of:

4.	**5.**	**6.**
38,697	1,528	3,086,089
807,340	98,963	720,103
27,869	873,490	48,094
730,893	5,069,034	3,237
8,600,732	404,609	61,276
795,486	70,375	302,405
8,756	7,787	79,058
430	746	60,663
75,063	636,283	87,027
704,928	92,677	564,844
38,065	5,858	30,313
60,704	193	7,901

7. From one million three hundred thousand take ninety-eight thousand nine.

8. From one billion one million one thousand one take ten million ten thousand ten.

1. From eighty million six hundred thousand take nine hundred eighty-four thousand seven hundred six.

2. From three million seventeen take seven hundred thousand three hundred six.

3.
8,076,431
−2,683,782

4.
78,060,004
−7,006,008

5.
37,940,383
−36,439,748

6.
243,074,692
−68,394,698

7.
30,069,431
−12,678,384

8.
53,870,000
−9,030,069

9.
600,080,709
−243,079,830

10.
57,000,370
−509,709

11.
7,230,002
−6,958,634

12.
265 × 2 = ?
265 × 30 = ?
265 × 400 = ?
265 × 432 = ?

13.
386 × 6 = ?
386 × 70 = ?
386 × 400 = ?
386 × 476 = ?

14.
437 × 4 = ?
437 × 80 = ?
437 × 900 = ?
437 × 984 = ?

15.
4064 × 2 = ?
4064 × 40 = ?
4064 × 600 = ?
4064 × 642 = ?

16.
8009 × 5 = ?
8009 × 20 = ?
8009 × 600 = ?
8009 × 625 = ?

17.
7846 × 4 = ?
7846 × 00 = ?
7846 × 300 = ?
7846 × 304 = ?

In the same way multiply:

18. 684 × 374
19. 850 × 486
20. 974 × 369
21. 750 × 408
22. 397 × 390
23. 765 × 609
24. 865 × 780
25. 309 × 708
26. 508 × 690

1. Multiply 47,084 by 207; by 386; by 460.
2. Multiply 890,608 by 330; by 459; by 683.
3. Multiply 3,690 by 2,694; by 3,078; by 6,008.
4. Multiply 8,070,896 by 27; by 34; by 806.
5. Multiply 379,605 by 608; by 3,007; by 9,000.
6. Multiply 80,976 by 7,089; by 6,903; by 20,008.
7. Multiply 809,769 by 723; by 684; by 985.
8. Multiply 34,086 by 4,567; by 3,289; by 10,309.

9. 3,864 ÷ 21
10. 4,065 ÷ 32
11. 7,506 ÷ 43
12. 8,370 ÷ 64
13. 7,009 ÷ 75
14. 83,704 ÷ 65
15. 70,963 ÷ 83
16. 58,074 ÷ 66
17. 30,976 ÷ 48
18. 50,867 ÷ 59
19. 680,096 ÷ 72
20. 430,765 ÷ 68
21. 540,008 ÷ 79
22. 378,096 ÷ 88
23. 568,374 ÷ 59

24. 800,000 ÷ 40
25. 800,000 ÷ 400
26. 800,000 ÷ 4,000
27. 600,000 ÷ 2,000
28. 900,000 ÷ 3,000
29. 720,900 ÷ 900
30. 836,000 ÷ 800
31. 786,940 ÷ 400
32. 270,963 ÷ 90
33. 510,660 ÷ 600
34. 580,760 ÷ 140
35. 380,742 ÷ 180
36. 461,370 ÷ 240
37. 307,065 ÷ 360
38. 508,690 ÷ 580

39. 3,860,945 ÷ 604
40. 7,096,034 ÷ 380
41. 9,654,378 ÷ 643
42. 8,046,850 ÷ 782
43. 9,730,696 ÷ 378
44. 3,460,943 ÷ 486
45. 1,097,068 ÷ 308
46. 2,769,543 ÷ 8,307
47. 708,694 ÷ 1,600
48. 806,097 ÷ 1,870
49. 586,038 ÷ 1,428
50. 78,309 ÷ 843
51. 210,694 ÷ 436
52. 6,953,100 ÷ 8,372
53. 7,486,094 ÷ 8,600
54. 8,378,960 ÷ 5,960
55. 7,839,527 ÷ 8,694
56. 2,783,789 ÷ 6,934
57. 9,860,372 ÷ 4,069
58. 6,890,374 ÷ 9,037

1. The size in square miles of various sections of Africa in 1892 was as follows: British Africa, 2,570,926; French Africa, 2,902,624; Portuguese Africa, 841,025; Spanish Africa, 203,767; German Africa, 822,000; Italian Africa, 602,000; Congo State, 865,400; Boer Republics, 162,640; Swazi Land, 6,370; Liberia, 37,000; Egypt and Tripoli, 836,000; Great Lakes, 80,350; unappropriated, 1,584,398. What is the area of the entire continent?

2. The area of the original thirteen colonies was 815,615 sq. mi. To this area there was acquired from France, 930,928 sq. mi.; from Spain, 59,268 sq. mi.; from Texas, 237,504 sq. mi.; from Oregon, 280,425 sq. mi.; from Mexico, 677,262 sq. mi.; from Russia, 577,390 sq. mi. What has been the increase during the past century? What is the present area of the United States? What is the area, exclusive of Alaska?

3. The following distances are given in a railroad timetable: From Chicago to Omaha, 493 mi.; to Cheyenne, 1,009 mi.; to Ogden, 1,527 mi.; to Palisade, 1,832 mi.; to Reno, 2,113 mi.; to Sacramento, 2,267 mi.; and to San Francisco, 2,357. How many miles from Omaha to Sacramento? from Cheyenne to San Francisco? from Palisade to San Francisco?

4. The train-time given from Chicago to Omaha is from 6 P. M. to 10 A. M. of the following day. How many miles an hour on the average does the train go? Supposing the train to run an average of 30 miles an hour, what time and on what day will it arrive at each of the above-named places if it started at 6 P. M., Monday?

1. The areas in square miles of the North Atlantic States are as follows: Maine, 29,895; New Hampshire, 9,005; Vermont, 9,135; Massachusetts, 8,040; Rhode Island, 1,085; Connecticut, 4,845; New York, 47,620; New Jersey, 7,455; Pennsylvania, 44,985. What area have all these States together? New York is how many times as large as Rhode Island? How many times as large as Massachusetts?

2. The area of England is 50,823 sq. mi.; of Wales, 7,363 sq. mi.; of Scotland, 30,417 sq. mi.; of Ireland, 32,583 sq. mi.; of Isle of Man and Channel Islands, 295 sq. mi. What is the area of the United Kingdom?

3. Compare, giving figures, the areas of England and Scotland; of New York and England; of Pennsylvania and Ireland; of Massachusetts and Wales; of Maine and Scotland.

4. The following table shows the total amount of the national debt on the 1st of July at various periods from 1860. Find the increase from 1860 to 1891.

Year.	Capital of Debt.	Year.	Capital of Debt.
1860	$64,842,287	1883	$1,884,171,728
1866	2,773,236,173	1884	1,830,528,923
1877	2,205,301,392	1887	1,700,771,948
1880	2,120,415,370	1890	1,555,630,910
		1891	1,610,620,103

5. From the above table find the increase or decrease of debt between 1860 and 1866; between 1866 and 1877; between 1877 and 1880; between 1880 and 1883; between 1883 and 1884; between 1884 and 1887; between 1887 and 1890; between 1890 and 1891; between 1866 and 1891.

		Area in Sq. Miles.	Population.
North Atlantic Division.	Maine	29,895	661,086
	N. H.	9,005	376,530
	Vermont	9,135	332,422
	Mass.	8,040	2,238,943
	R. I.	1,058	345,506
	Connecticut	4,845	746,258
	N. Y.	47,620	5,997,853
	N. J.	7,455	1,444,933
	Penn.	44,985	5,258,014
South Atlantic Division.	Delaware	1,960	168,493
	Maryland	9,860	1,042,390
	D. C.	60	230,393
	Virginia	40,125	1,655,980
	W. Virginia	24,645	762,794
	N. Carolina	48,580	1,617,947
	S. Carolina	30,170	1,151,149
	Georgia	58,980	1,837,353
	Florida	54,240	391,422
Southern Central Div.	Kentucky	40,000	1,858,635
	Tennessee	41,750	1,767,518
	Alabama	51,540	1,513,017
	Mississippi	46,340	1,289,600
	Louisiana	45,420	1,118,587
	Texas	262,290	2,235,523
	Ind. Ter.	31,000	177,782
	Okl. Ter.	38,830	61,834
	Arkansas	53,045	1,128,179
Northern Central Division.	Ohio	40,760	3,672,316
	Indiana	35,910	2,192,404
	Illinois	56,000	3,826,351
	Michigan	57,430	2,093,889
	Wisconsin	54,440	1,686,880
	Minnesota	79,205	1,301,826
	Iowa	55,475	1,911,896
	Missouri	68,735	2,679,184
	N. Dakota	70,195	182,719
	S. Dakota	76,850	328,808
	Nebraska	76,840	1,058,910
	Kansas	81,700	1,427,096
Western Division.	Montana	39,159	132,159
	Wyoming	20,789	60,705
	Colorado	194,327	412,198
	N. M. Ter.	119,565	153,593
	Arizona Ter.	40,440	59,620
	Utah Ter.	143,963	207,905
	Nevada	109,740	45,761
	Idaho	84,290	84,385
	Washington	66,880	349,390
	Oregon	94,560	313,767
	California	155,980	1,208,130
	Alaska Ter.	531,410	31,795

From the above table find the area and population in 1890 of the:

1. North Atlantic Division.
2. South Atlantic Division.
3. Southern Central Div.
4. Northern Central Division.
5. Western Division.
6. The entire country.
7. Find the number of people to a sq. mi. in each div.

1. Compare the area and population of any State as given in the preceding table with the following figures, giving problems and answers; *e.g.*, Maine has 613 more square miles area than Bavaria.

Country.	Area in Sq. Miles.	Population.	Country.	Area in Sq. Miles.	Population.
Portugal	34,038	4,708,178	China	1,336,841	386,853,029
England	50,823	27,482,104	Italy	114,410	30,158,408
France	204,092	38,343,192	Japan	147,655	40,072,020
Germany	208,738	49,416,476	Spain	197,670	17,550,246

2. Find the number of inhabitants to a square mile in each of the above countries.

3. Compare the area and population of your State with those of each of the above countries. Make problems.

4. The receipts of the United States treasury for the year ending June 30, 1891, were as follows: from customs, $219,522,205; internal revenue, $145,686,250; all other sources, $27,403,992. The total ordinary expenditures were as follows: civil expenses, $27,143,925; Indians, $8,527,469; pensions, $124,415,951; army, $48,720,065; navy, $26,498,245; all other expenses, $20,067,029. What was the excess of revenue over expenditures? How much more was paid for pensions than for the support of the army and navy?

5. The earth's diameter is 7,925 miles. How many hours would it take a locomotive to go around the earth at the rate of 25 miles an hour, counting the distance three times the diameter? How many days, allowing 2 hours a day for stops?

1. Light travels about 195,000 miles a second. How many miles does it travel in an hour?

2. The velocity of sound is 1090 ft. per second. How many times greater is the velocity of light than that of sound?

3. The population of the United States in 1840 was 17,069,453; in 1850 it was 23,191,876; in 1860 it was 38,443,321; in 1870 it was 38,558,371; in 1880 it was 50,155,783; in 1890 it was 62,831,827. What was the total increase for each decade?

4. The population of the United States in 1800 was 5,308,483. In 1890 it was 62,831,827. What was the average increase annually?

5. A man bought a farm of 360 acres for $28 an acre. After expending $1346 for improvements he sold it for $14,600. Did he gain or lose, and how much?

6. The cotton crop of the United States in 1891 amounted to 8,655,518 bales. If the average weight per bale was 425 pounds, and the average price 14¢ per pound, what was the total value of the crop?

7. Find out the following facts and make problems about them:

   a. Area in square miles of your town or city, county and State.

   b. Population at the last census of your town or city, county and State.

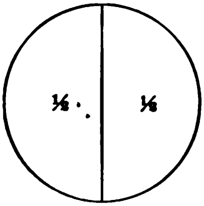
   c. The crop of greatest value raised in your State, and its value.

   d. The greatest amount of iron obtained in any one State, and the worth of it. The same of coal.

SECTION III.

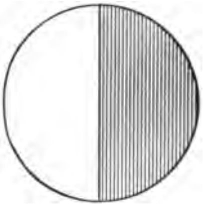
HALVES, FOURTHS, AND EIGHTHS.

Oral and Sight Exercises.



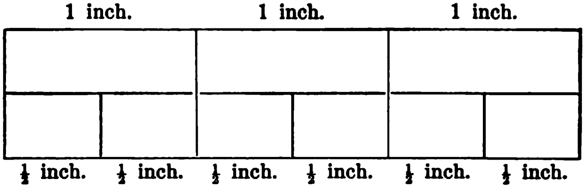
$\frac{1}{2}+\frac{1}{2}=$

$\frac{1}{2}\times 2=$



$1-\frac{1}{2}=$

$1\div\frac{1}{2}=$



1. $\frac{1}{2}$ inch + $\frac{1}{2}$ inch = — inch. $\frac{1}{2}+\frac{1}{2}=?$
2. $1\frac{1}{2}$ inches + $\frac{1}{2}$ inch = — inches. $1\frac{1}{2}+\frac{1}{2}=?$
3. 1 inch − $\frac{1}{2}$ inch = — inches. $1-\frac{1}{2}=?$
4. 3 inches − $1\frac{1}{2}$ inches = — inches. $3-1\frac{1}{2}=?$
5. 2 times $\frac{1}{2}$ inch = — inch. $\frac{1}{2}\times 2=?$
6. 3 times $\frac{1}{2}$ inch = — inches. $\frac{1}{2}\times 3=?$
7. 4 inches contain 2 inches — times. $4\div 2=?$
8. 1 inch contains $\frac{1}{2}$ inch — times. $1\div\frac{1}{2}=?$
9. $1\frac{1}{2}$ inches contain $\frac{1}{2}$ inch — times. $1\frac{1}{2}\div\frac{1}{2}=?$
10. 3 inches contain $\frac{1}{2}$ inch — times. $3\div\frac{1}{2}=?$

1.	**2.**	**3.**	**4.**	**5.**
$\frac{1}{2}+\frac{1}{2}$	$1-\frac{1}{2}$	$11\frac{1}{2}+2\frac{1}{2}$	$17\frac{1}{2}+9\frac{1}{2}$	$21+9\frac{1}{2}$
$1+\frac{1}{2}$	$1\frac{1}{2}-\frac{1}{2}$	$17\frac{1}{2}-6\frac{1}{2}$	$28\frac{1}{2}-9\frac{1}{2}$	$36-5\frac{1}{2}$
$1\frac{1}{2}+\frac{1}{2}$	$3-\frac{1}{2}$	$18-9\frac{1}{2}$	$34+12\frac{1}{2}$	$43-7\frac{1}{2}$
$2\frac{1}{2}+\frac{1}{2}$	$4\frac{1}{2}-\frac{1}{2}$	$24-8\frac{1}{2}$	$36-8\frac{1}{2}$	$51\frac{1}{2}+8\frac{1}{2}$
$8\frac{1}{2}+\frac{1}{2}$	$8\frac{1}{2}-\frac{1}{2}$	$32\frac{1}{2}+6\frac{1}{2}$	$47\frac{1}{2}+7\frac{1}{2}$	$62-6\frac{1}{2}$
$1\frac{1}{2}+2\frac{1}{2}$	$4-1\frac{1}{2}$	$43\frac{1}{2}+7\frac{1}{2}$	$52\frac{1}{2}-6$	$75\frac{1}{2}+8\frac{1}{2}$
$9\frac{1}{2}+3\frac{1}{2}$	$9\frac{1}{2}-1\frac{1}{2}$	$40-6\frac{1}{2}$	$54-5\frac{1}{2}$	$70-7\frac{1}{2}$
$13\frac{1}{2}+7\frac{1}{2}$	$18\frac{1}{2}-4\frac{1}{2}$	$37\frac{1}{2}+9\frac{1}{2}$	$69+7\frac{1}{2}$	$80\frac{1}{2}+11\frac{1}{2}$
$19\frac{1}{2}+9\frac{1}{2}$	$24\frac{1}{2}-7\frac{1}{2}$	$54-8\frac{1}{2}$	$75\frac{1}{2}-6\frac{1}{2}$	$86+12\frac{1}{2}$

6. Express in other denominations, $\frac{1}{2}$ of a dozen; $\frac{1}{2}$ of a dollar; $\frac{1}{2}$ of a pound; $\frac{1}{2}$ of a foot; $\frac{1}{2}$ of a gallon; $\frac{1}{2}$ of a bushel; $\frac{1}{2}$ of a peck; $\frac{1}{2}$ of an hour; $\frac{1}{2}$ of a century; $\frac{1}{2}$ of a gross; $\frac{1}{2}$ of a yard.

7. Express in other denominations, $\frac{1}{2}$ of a yard; $\frac{1}{2}$ of a week; $\frac{1}{2}$ of a year; $\frac{1}{2}$ of 3 dollars; $\frac{1}{2}$ of a ton; $\frac{1}{2}$ of a quire; $\frac{1}{2}$ of a ream; $\frac{1}{2}$ of a mile; $\frac{1}{2}$ of 3 shillings; $\frac{1}{2}$ of a league; $\frac{1}{2}$ of a day.

8. What is $\frac{1}{2}$ of the following numbers: 17? 29? 37? 41? 53? 69? 75? 83? 97? 111?

9. Express as whole or mixed numbers the following fractions: $\frac{4}{2}$; $\frac{8}{2}$; $\frac{5}{2}$; $\frac{20}{2}$; $\frac{11}{2}$; $\frac{37}{2}$; $\frac{45}{2}$; $\frac{51}{2}$; $\frac{68}{2}$; $\frac{75}{2}$; $\frac{89}{2}$; $\frac{110}{2}$.

10. Add $3\frac{1}{2}$ to each of the following: $4\frac{1}{2}+7$; $8+3\frac{1}{2}$; $17-4\frac{1}{2}$; $13\frac{1}{2}-5\frac{1}{2}$; $16\frac{1}{2}+5\frac{1}{2}$; $7\times 6\frac{1}{2}$; $8\times 9\frac{1}{2}$; $47-12\frac{1}{2}$; $83\frac{1}{2}+9\frac{1}{2}$; $91\frac{1}{2}-10\frac{1}{2}$.

11. At $1\frac{1}{2}$ cents apiece, what will the following articles cost: 5 apples? a dozen eggs? 9 oranges? half a dozen books? 17 marbles? 25 envelopes?

1.	**2.**	**3.**	**4.**	**5.**
$\frac{1}{2}\times 2$	$9\frac{1}{2}\times 5$	$\frac{2}{2}\div 2$	$1\frac{1}{2}\div\frac{1}{2}$	$9\times 7\frac{1}{2}$
$\frac{1}{2}\times 4$	$7\frac{1}{2}\times 8$	$\frac{4}{2}\div 2$	$2\frac{1}{2}\div\frac{1}{2}$	$19-12\frac{1}{2}$
$\frac{1}{2}\times 3$	$3\frac{1}{2}\times 12$	$1\div 2$	$8\frac{1}{2}\div\frac{1}{2}$	$42\frac{1}{2}-11$
$\frac{1}{2}\times 7$	$5\frac{1}{2}\times 9$	$\frac{2}{4}\div\frac{1}{2}$	$10\frac{1}{2}\div\frac{1}{2}$	$68+17\frac{1}{2}$
$1\frac{1}{2}\times 2$	$6\frac{1}{2}\times 7$	$\frac{3}{2}\div\frac{1}{2}$	$5\frac{1}{2}\times 8$	$7\times 13\frac{1}{2}$
$2\frac{1}{2}\times 4$	$7\frac{1}{2}\times 6$	$2\div\frac{1}{2}$	$7\frac{1}{2}\times 3$	$83\frac{1}{2}-12$
$1\frac{1}{2}\times 6$	$9\frac{1}{2}\times 4$	$4\div\frac{1}{2}$	$7\frac{1}{2}\div\frac{1}{2}$	$77\frac{1}{2}+11\frac{1}{2}$
$1\frac{1}{2}\times 7$	$6\frac{1}{2}\times 9$	$9\div\frac{1}{2}$	$2\frac{1}{2}\times 11$	$84\frac{1}{2}-7\frac{1}{2}$
$2\frac{1}{2}\times 12$	$7\frac{1}{2}\times 12$	$8\div\frac{1}{2}$	$5\times 7\frac{1}{2}$	$7\times 12\frac{1}{2}$
$8\frac{1}{2}\times 7$	$9\frac{1}{2}\times 11$	$11\div\frac{1}{2}$	$3\div 1\frac{1}{2}$	$100\frac{1}{2}-12\frac{1}{2}$

6. $5\frac{1}{2}$ pounds + $7\frac{1}{2}$ pounds − $3\frac{1}{2}$ pounds + $9\frac{1}{2}$ pounds − $11\frac{1}{2}$ pounds are how many pounds?

7. John works a week at a dollar and a half a day, and at the end of the week pays five dollars and a half for his board. How many dollars has he left?

8. I buy 3 lb. of meat at $12\frac{1}{2}$¢ a pound, and $2\frac{1}{2}$ qt. of milk at 6¢ a quart. I give the clerk a dollar bill. What change should I receive?

9. I buy $2\frac{1}{2}$ doz. eggs for 40¢ and sell them at the rate of $1\frac{1}{2}$¢ apiece. How many cents do I gain or lose?

10. I bought 3 qt. of milk at $1\frac{1}{2}$¢ a pint, 6 apples at $\frac{1}{2}$ of a cent apiece, 10 oranges at $1\frac{1}{2}$¢ apiece, $2\frac{1}{2}$ lb. of fish at 7¢ a pound. How much did all cost?

11. From $7\frac{1}{2}\times 6$ I can make the following problem; What will 6 lb. of sugar cost at $7\frac{1}{2}$¢ a pound? Make in your own words, and perform problems from the following: $8\times 12\frac{1}{2}$; $8\frac{1}{2}\times 7$; $16\frac{1}{2}+3\frac{1}{2}$; $17-4\frac{1}{2}$; $7\times 3\frac{1}{2}$; $18\frac{1}{2}-7\frac{1}{2}-3\frac{1}{2}$; $5\frac{1}{2}\times 7-3\frac{1}{2}$.

1. How many times ½ is 1? 2? 4? 7? 10? 14? 20? 32? 42? 48?

2. How many times ½ is 1½? 2½? 4½? 8½? 12½? 16½? 26½? 41½? 50½? 61½?

3. ½ is contained in the following numbers how many times: 8? 2½? 12? 12½? 7½? 9½? 15½? 25½? 36½?

4. At 2 cents apiece, how many oranges can I buy for 8¢? for 12¢? for 16¢? for 24¢?

5. At ½ of a cent apiece, how many apples can I buy for 8¢? for 12¢? for 16¢? for 24¢?

6. How many cupfuls of milk, each cup holding ½ of a gill, will it take to fill a quart measure?

7. At 3½¢ a pint, how much will 2 gallons of milk cost? 3½ gallons?

8. How many dozen marbles can I buy for 33 cents, at ½ of a cent apiece?

9.

$12 + ? = 17\frac{1}{2}$
$? + 9\frac{1}{2} = 26$
$18 - 7\frac{1}{2} = ?$
$8 \times 9\frac{1}{2} = ?$
$? \div \frac{1}{2} = 4$
$? \div \frac{1}{2} = 9$
$7 \times ? = 3\frac{1}{2}$
$19 \div \frac{1}{2} = ?$
$? - 7\frac{1}{2} = 14$
$20 - 12\frac{1}{2} = ?$

10.

$18\frac{1}{2} + 9\frac{1}{2} = ?$
$30 - 11\frac{1}{2} = ?$
$27\frac{1}{2} \div \frac{1}{2} = ?$
$5\frac{1}{2} \times ? = 33$
$27\frac{1}{2} - 10\frac{1}{2} = ?$
$26\frac{1}{2} + ? = 37$
$30 - ? = 19\frac{1}{2}$
$? \div \frac{1}{2} = 14\frac{1}{2}$
$25\frac{1}{2} + 11\frac{1}{2} = ?$
$32\frac{1}{2} - 12 = ?$

11.

$28 \div \frac{1}{2} = ?$
$21\frac{1}{2} \div ? = 43$
$47 \div \frac{1}{2} = ?$
$45\frac{1}{2} - ? = 38$
$47\frac{1}{2} + 9\frac{1}{2} = ?$
$50\frac{1}{2} \div \frac{1}{2} = ?$
$7\frac{1}{2} \times 12 = ?$
$48 - 12\frac{1}{2} = ?$
$? - 10\frac{1}{2} = 40$
$? + 39 = 50\frac{1}{2}$

Make up stories from any ten of the above problems.

1.

$63\frac{1}{2}+? = 70$
$80-? = 74\frac{1}{2}$
$? \times 2 = 59$
$7\frac{1}{2} \times 12 = ?$
$90\frac{1}{2}-10\frac{1}{2} = ?$
$70\frac{1}{2}-9\frac{1}{2} = ?$
$42\frac{1}{2} \div \frac{1}{2} = ?$
$91-? = 84\frac{1}{2}$
$21 \div 3\frac{1}{2} = ?$
$18\frac{1}{2} \times 5 = ?$

2.

$30\frac{1}{2}-3\frac{1}{2} \quad \div \frac{1}{2} = ?$
$17-10\frac{1}{2} \times 6 = ?$
$8\frac{1}{2} \times 2 \quad -6\frac{1}{2} = ?$
$3 \times 9\frac{1}{2} \quad +2\frac{1}{2} = ?$
$19-6\frac{1}{2} \quad +9\frac{1}{2} = ?$
$7\frac{1}{2}+8\frac{1}{2} \quad \div \frac{1}{2} = ?$
$18\frac{1}{2}-9 \quad \div \frac{1}{2} = ?$
$7 \times 9\frac{1}{2} \quad +8\frac{1}{2} = ?$
$15 \times 2\frac{1}{2} \quad -7\frac{1}{2} = ?$
$17\frac{1}{2} \div \frac{1}{2} \quad -8\frac{1}{2} = ?$

3.

$40+11\frac{1}{2}+6\frac{1}{2} = ?$
$37\frac{1}{2}-9\frac{1}{2} \quad -8\frac{1}{2} = ?$
$12\frac{1}{2} \times 4 \quad -12\frac{1}{2} = ?$
$8 \times 7\frac{1}{2} \quad -9\frac{1}{2} = ?$
$14\frac{1}{2} \div \frac{1}{2} \quad -7\frac{1}{2} = ?$
$4 \times 18\frac{1}{2}+6\frac{1}{2} = ?$
$17\frac{1}{2} \div \frac{1}{2} \quad -7\frac{1}{2} = ?$
$4\frac{1}{2} \times 12 \quad \div \frac{1}{2} = ?$
$25\frac{1}{2}+12\frac{1}{2}-6\frac{1}{2} = ?$
$10-7\frac{1}{2} \quad \times 16 = ?$

Make up stories from any ten of the above problems.

4. When eggs are worth $1\frac{1}{2}$¢ apiece, what must I pay for $2\frac{1}{2}$ dozen?

5. What will $4\frac{1}{2}$ gallons of molasses cost at the rate of $10\frac{1}{2}$¢ a quart?

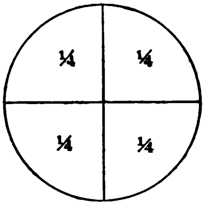
6. From $2\frac{1}{2}$ lb. of cheese there was sold at one time $6\frac{1}{2}$ oz., and at another time $9\frac{1}{2}$ oz. What is the remainder worth at 12¢ a pound?

7. I buy at the store 10 lb. of sugar at $7\frac{1}{2}$¢ a pound, and $3\frac{1}{2}$ gal. oil at 15¢ a gallon, and give in payment a two-dollar bill. What change should I receive?

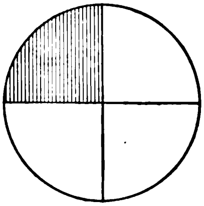
8. If 4 cents is one-half of all the money you have, how much have you? (Show by drawing.)

9. The age of John is 6 years, which is one-half the age of Robert. What is the age of Robert?

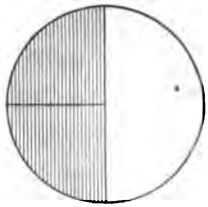
10. At 20¢ a peck, what will $6\frac{1}{2}$ pecks of apples cost? $2\frac{1}{2}$ bushels?



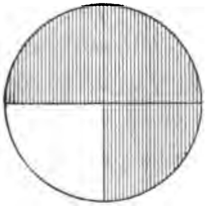
$\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}=$
$\frac{1}{4}\times 4=$



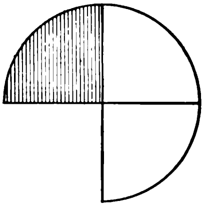
$1-\frac{1}{4}=$
$1\div\frac{1}{4}=$



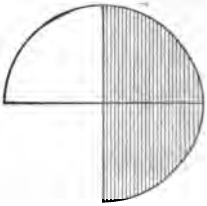
$\frac{2}{4}=\frac{1}{2}$
$1-\frac{1}{2}=$



$1-\frac{3}{4}=$
$1\div\frac{3}{4}=$



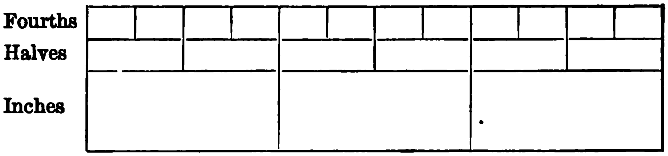
$\frac{3}{4}-\frac{1}{4}=$
$\frac{3}{4}\div\frac{1}{4}=$



$\frac{3}{4}-\frac{1}{2}=$
$\frac{3}{4}\div\frac{1}{2}=$

Draw circles and cut disks showing:

1. How many fourths in one?
2. How many fourths in one-half?
3. Two times one-fourth are how much?
4. Three times one-fourth are how much?
5. Three-fourths is how much larger than one-half?
6. One-half is how much larger than one-fourth?
7. Two times $\frac{1}{4}$ are how many halves? $\frac{1}{4}\times 2=?$
8. Five times $\frac{1}{4}$ are how many ones? $\frac{1}{4}\times 5=?$
9. Three contains $\frac{3}{4}$ how many times? $3\div\frac{3}{4}=?$
10. In the fraction $\frac{3}{4}$, — shows the number of parts into which the unit is divided, and — shows the number of parts taken. The denominator is —; the numerator is —.



1. 1 inch + $\frac{1}{4}$ inch = — inches. $1 + \frac{1}{4} = ?$
2. $\frac{1}{4}$ inch + $\frac{1}{4}$ inch = — of an inch. $\frac{1}{4} + \frac{1}{4} = ?$
3. $\frac{3}{4}$ of an inch + $\frac{1}{2}$ inch = — inches. $\frac{3}{4} + \frac{1}{2} = ?$
4. $1\frac{1}{2}$ inches + $\frac{3}{4}$ of an inch = — inches. $1\frac{1}{2} + \frac{3}{4} = ?$
5. $1\frac{3}{4}$ inches + $\frac{3}{4}$ of an inch = — inches. $1\frac{3}{4} + \frac{3}{4} = ?$
6. 1 inch − $\frac{1}{4}$ inch = — of an inch. $1 - \frac{1}{4} = ?$
7. $\frac{3}{4}$ of an inch − $\frac{1}{2}$ an inch = — inch. $\frac{3}{4} - \frac{1}{2} = ?$
8. $1\frac{1}{2}$ inches − $\frac{1}{4}$ inch = — inches. $1\frac{1}{2} - \frac{1}{4} = ?$
9. 3 inches − $\frac{3}{4}$ of an inch = — inches. $3 - \frac{3}{4} = ?$
10. $2\frac{1}{2}$ inches − $\frac{3}{4}$ of an inch = — inches. $2\frac{1}{2} - \frac{3}{4} = ?$
11. 5 times $\frac{1}{2}$ inch = — inches. $\frac{1}{2} \times 5 = ?$
12. 2 times $\frac{1}{4}$ inch = — inch. $\frac{1}{4} \times 2 = ?$
13. 6 times $\frac{1}{4}$ inch = — inches. $\frac{1}{4} \times 6 = ?$
14. 5 times $\frac{1}{4}$ inch = — inches. $\frac{1}{4} \times 5 = ?$
15. 2 times $\frac{3}{4}$ of an inch = — inches. $\frac{3}{4} \times 2 = ?$
16. 3 times $\frac{3}{4}$ of an inch = — inches. $\frac{3}{4} \times 3 = ?$
17. 7 times $\frac{1}{4}$ of an inch = — inches. $\frac{1}{4} \times 7 = ?$
18. 2 inches contain $\frac{1}{4}$ inch — times. $2 \div \frac{1}{4} = ?$
19. 3 inches contain $\frac{1}{4}$ inch — times. $3 \div \frac{1}{4} = ?$
20. $1\frac{1}{4}$ inches contain $\frac{1}{4}$ inch — times. $1\frac{1}{4} \div \frac{1}{4} = ?$
21. $1\frac{1}{2}$ inches contain $\frac{3}{4}$ of an inch — times. $1\frac{1}{2} \div \frac{3}{4} = ?$
22. $2\frac{1}{4}$ inches contain $\frac{3}{4}$ of an inch — times. $2\frac{1}{4} \div \frac{3}{4} = ?$
23. 3 inches contains $\frac{3}{4}$ of an inch — times. $3 \div \frac{3}{4} = ?$
24. $\frac{1}{2}$ of $\frac{1}{2}$ inch is — inch. $\frac{1}{2}$ of $\frac{1}{2} = ?$
25. $\frac{1}{4}$ of 2 inches is — inch. $\frac{1}{4}$ of $2 = ?$

Show with disks:

1.

$\frac{1}{4}+\frac{1}{4}$
$\frac{3}{4}+\frac{1}{4}$
$\frac{3}{4}+\frac{2}{4}$
$\frac{1}{4}+\frac{3}{4}$
$\frac{3}{4}+\frac{3}{4}$
$1\frac{3}{4}+\frac{1}{4}$
$1\frac{1}{4}+\frac{3}{4}$
$1\frac{2}{4}+\frac{2}{4}$
$1\frac{3}{4}+\frac{2}{4}$
$2\frac{3}{4}+\frac{3}{4}$

2.

$1+1\frac{1}{4}$
$2\frac{1}{4}+3$
$1\frac{3}{4}+1\frac{1}{4}$
$2\frac{2}{4}+1\frac{2}{4}$
$1\frac{3}{4}+1\frac{2}{4}$
$1\frac{3}{4}+2\frac{3}{4}$
$2\frac{1}{4}+6\frac{3}{4}$
$3\frac{3}{4}+2\frac{3}{4}$
$4\frac{1}{4}+3\frac{2}{4}$
$5\frac{3}{4}+4\frac{3}{4}$

3.

$1-\frac{1}{4}$
$1-\frac{3}{4}$
$\frac{3}{4}-\frac{1}{4}$
$\frac{3}{4}-\frac{2}{4}$
$1\frac{1}{4}-\frac{1}{4}$
$1\frac{3}{4}-\frac{1}{4}$
$1\frac{1}{4}-\frac{2}{4}$
$1\frac{2}{4}-\frac{3}{4}$
$1\frac{1}{4}-\frac{2}{4}$
$3\frac{1}{4}-\frac{3}{4}$

4.

$\frac{1}{2}+\frac{1}{4}$
$\frac{3}{4}+\frac{1}{2}$
$1\frac{1}{4}+\frac{1}{2}$
$2\frac{1}{2}+\frac{3}{4}$
$3\frac{1}{2}+\frac{1}{4}$
$\frac{1}{2}-\frac{1}{4}$
$\frac{3}{4}-\frac{1}{2}$
$1\frac{1}{4}-\frac{1}{2}$
$1\frac{1}{2}-\frac{3}{4}$
$1\frac{1}{4}-\frac{1}{2}$

5.

$1\frac{1}{2}+1\frac{1}{2}$
$1\frac{1}{4}+1\frac{3}{4}$
$1\frac{1}{2}+1\frac{1}{4}$
$1\frac{1}{2}+1\frac{3}{4}$
$1\frac{3}{4}-1\frac{1}{4}$
$2\frac{1}{4}-1\frac{1}{2}$
$3-2\frac{3}{4}$
$4\frac{1}{4}-1\frac{1}{2}$
$5\frac{1}{2}-1\frac{3}{4}$
$4\frac{1}{4}-1\frac{3}{4}$

6. Give fractional combinations in halves and fourths of the following numbers: 1 ($1=\frac{1}{2}+\frac{1}{2}=\frac{1}{4}+\frac{3}{4}=\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}=\frac{3}{4}+\frac{1}{4}$); $\frac{3}{4}$; $\frac{1}{2}$; $1\frac{1}{4}$; $1\frac{1}{2}$; $1\frac{3}{4}$; 2; $2\frac{1}{4}$; $2\frac{1}{2}$; 3.

7. Express in whole or mixed numbers and reduce to lowest terms the following: $\frac{5}{2}$; $\frac{16}{2}$; $\frac{11}{4}$; $\frac{22}{4}$; $\frac{17}{2}$; $\frac{41}{4}$; $\frac{27}{2}$; $\frac{34}{4}$; $\frac{50}{4}$; $\frac{42}{4}$.

8. How many halves and fourths in the following numbers: 1? $1\frac{1}{2}$? 2? $2\frac{1}{2}$? 3? $3\frac{1}{2}$? 4? $5\frac{1}{2}$? 7?

9. How many fourths in the following: 1? $1\frac{1}{4}$? $1\frac{1}{2}$? $1\frac{3}{4}$? 2? $2\frac{1}{2}$? $3\frac{1}{4}$? $4\frac{3}{4}$? $5\frac{1}{2}$? $8\frac{1}{4}$?

10. How many times $\frac{1}{4}$ is 2? 4? 6? $2\frac{1}{2}$? $3\frac{1}{2}$? $4\frac{1}{4}$? $3\frac{3}{4}$? $8\frac{3}{4}$? $10\frac{1}{4}$? $6\frac{1}{2}$?

11. $\frac{3}{4}$ of 8? 12? 16? 24? 20? 5? 9? 17? 21? 10?

12. 2 is $\frac{1}{2}$ of what number? 6? 5? 8? $2\frac{1}{2}$? $4\frac{1}{4}$? $6\frac{1}{4}$? $1\frac{1}{4}$? $\frac{3}{4}$? $1\frac{3}{4}$? $6\frac{3}{4}$?

13. 4 is $\frac{1}{4}$ of what number? 8? 12? 3? 7? $2\frac{1}{4}$? $3\frac{3}{4}$? $1\frac{1}{2}$? $6\frac{1}{2}$? $10\frac{1}{4}$? $8\frac{1}{2}$?

1.
$\frac{1}{4} \times 4$
$\frac{1}{4} \times 2$
$\frac{2}{4} \times 2$
$\frac{3}{4} \times 2$
$\frac{1}{4} \times 3$
$\frac{3}{4} \times 3$
$1\frac{1}{4} \times 4$
$1\frac{3}{4} \times 4$
$4\frac{1}{4} \times 5$
$6\frac{1}{4} \times 6$

2.
$\frac{1}{2} \times 4$
$\frac{1}{2} \times 3$
$1\frac{1}{2} \times 2$
$1\frac{1}{2} \times 4$
$1\frac{3}{4} \times 2$
$1\frac{1}{4} \times 4$
$4 \times 1\frac{1}{2}$
$8 \times 1\frac{1}{4}$
$6 \times 2\frac{3}{4}$
$9 \times 3\frac{3}{4}$

3.
$\frac{1}{4}$ of 1
$\frac{1}{2}$ of $\frac{2}{4}$
$\frac{1}{2}$ of $\frac{1}{2}$
$\frac{1}{2}$ of 3
$\frac{1}{4}$ of 2
$\frac{1}{4}$ of 3
$\frac{3}{4}$ of 8
$\frac{3}{4}$ of 10
$\frac{1}{2}$ of $4\frac{1}{2}$
$\frac{1}{2}$ of $6\frac{1}{2}$

4.
$1 \div 4$
$\frac{2}{4} \div 2$
$\frac{1}{2} \div 2$
$3 \div 2$
$2 \div 4$
$3 \div 4$
$1\frac{1}{2} \div 2$
$2\frac{1}{2} \div 2$
$4\frac{1}{2} \div 2$
$6\frac{1}{2} \div 2$

5.
$1 \div \frac{1}{2}$
$1 \div \frac{1}{4}$
$2 \div \frac{1}{2}$
$2 \div \frac{1}{4}$
$4 \div \frac{1}{2}$
$6 \div \frac{1}{4}$
$2\frac{1}{2} \div \frac{1}{2}$
$3\frac{1}{2} \div \frac{1}{2}$
$3 \div \frac{1}{4}$
$4 \div \frac{1}{4}$

6.
$6 \div \frac{1}{4}$
$8 \div \frac{1}{2}$
$5 \div \frac{1}{4}$
$2 \div \frac{1}{4}$
$3\frac{1}{2} \div \frac{1}{2}$
$2\frac{1}{4} \div \frac{1}{4}$
$4\frac{1}{4} \div \frac{1}{4}$
$6\frac{1}{2} \div \frac{1}{2}$
$8\frac{1}{4} \div \frac{1}{4}$
$8\frac{1}{2} \div \frac{1}{4}$

7.
$8\frac{3}{4} + 7\frac{1}{2}$
$6\frac{1}{2} - 5\frac{1}{4}$
$3\frac{1}{4} \times 8$
$18\frac{1}{4} - \frac{1}{2}$
$7\frac{1}{2} + 6$
$1\frac{1}{2} \times 1\frac{1}{2}$
$4\frac{3}{4} \div \frac{1}{4}$
$10\frac{1}{4} - 8\frac{1}{2}$
$9\frac{3}{4} + 1\frac{3}{4}$
$6 \times 8\frac{3}{4}$

8.
$4\frac{3}{4} \times 8$
$4\frac{1}{2} + 1\frac{3}{4}$
$8 - 3\frac{1}{4}$
$6 \times 7\frac{1}{2}$
$10 \div 1\frac{1}{4}$
$100 - 12\frac{3}{4}$
$7 \times 8\frac{1}{2}$
$10\frac{1}{4} \div \frac{1}{4}$
$56\frac{3}{4} + 8\frac{1}{2}$
$100 \div \frac{1}{4}$

9.
$20 - 6\frac{1}{2}$
$8\frac{1}{4} + 3\frac{1}{2}$
$3\frac{3}{4} + 4\frac{3}{4}$
$12 \div \frac{1}{2}$
$6\frac{1}{4} \times 1\frac{1}{2}$
$8 \times 3\frac{3}{4}$
$7 \times 2\frac{1}{4}$
$27\frac{1}{2} - 4\frac{1}{4}$
$8\frac{1}{4} - 1\frac{1}{2}$
$6\frac{1}{4} + 8\frac{1}{2}$

10.
$9 \times 3\frac{1}{4}$
$4\frac{3}{4} \times 4$
$27 - 9\frac{1}{4}$
$2\frac{1}{2} \div \frac{1}{4}$
$4\frac{1}{2} - 3\frac{3}{4}$
$8 \times 3\frac{1}{2}$
$17\frac{1}{2} - 4\frac{3}{4}$
$2\frac{1}{4} \times 8$
$12 \times 3\frac{3}{4}$
$8 \times 4\frac{3}{4}$

11. In $\frac{3}{4}$ of a peck, how many quarts?

12. In $\frac{3}{4}$ of a bushel, how many pecks?

13. Add $\frac{1}{2}$ of a gallon to $\frac{1}{2}$ of a quart. How many pints?

14. From $\frac{1}{2}$ of a peck take $\frac{3}{4}$ of a quart. How many quarts? How many pints?

15. $\frac{3}{4}$ of a foot and $\frac{1}{2}$ of a foot are how many inches?

1. $\frac{1}{2}$ of a bushel less $\frac{1}{2}$ of a peck is how many pecks? How many quarts?

2. In $\frac{1}{2}$ of a bushel, how many half-pecks? How many half-quarts?

3.

$4\frac{1}{4} + 3\frac{1}{4} = ?$
$8 + ? = 12\frac{1}{4}$
$? + 6\frac{1}{4} = 10\frac{1}{2}$
$8 - 2\frac{3}{4} = ?$
$10\frac{1}{4} - ? = 2\frac{1}{2}$
$? \div 3 = 6\frac{3}{4}$
$3\frac{3}{4} \times 2 = ?$
$10\frac{1}{2} \div 2 = ?$
$\frac{1}{2} \times ? = 4$
$2 \div ? = \frac{1}{2}$

4.

$1\frac{1}{2} - ? = \frac{3}{4}$
$2\frac{1}{4} - 1\frac{1}{2} = ?$
$1\frac{1}{2} \times ? = 6$
$6 \div ? = 12$
$2\frac{3}{4} + ? = 6$
$? + 1\frac{3}{4} = 4\frac{1}{4}$
$6 \times 1\frac{3}{4} = ?$
$8\frac{1}{4} - 2\frac{1}{2} = ?$
$? + 1\frac{1}{4} = 3\frac{1}{2}$
$1\frac{1}{2} \div 2 = ?$

5.

$8 \times 3\frac{3}{4} = ?$
$10 - ? = 7\frac{1}{4}$
$9\frac{1}{4} + 6\frac{1}{2} = ?$
$12\frac{1}{2} \div \frac{1}{2} = ?$
$6\frac{1}{4} + ? = 25$
$7\frac{3}{4} + 6\frac{3}{4} = ?$
$5\frac{1}{4} \times 8 = ?$
$? \times 4 = 2$
$2\frac{1}{2} + ? = 10\frac{1}{4}$
$? - 6\frac{1}{4} = 13\frac{1}{2}$

6. If a horse eats $\frac{1}{2}$ pk. of oats at a time, and eats three times a day, how many days will $4\frac{1}{2}$ pecks last? How many days will $4\frac{1}{2}$ bushels last?

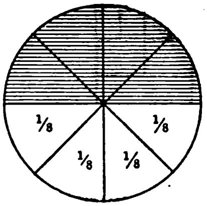
7. What will a quart of milk cost if $1\frac{1}{2}$ quarts cost 9 cents? (Draw a picture of the measures.)

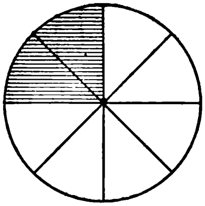
8. I pay 9 cents for $1\frac{1}{2}$ quarts of milk. What should I pay for 2 gallons at the same price?

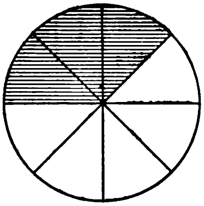
9. If $\frac{1}{2}$ of a yard of cloth costs 12 cents, what will $2\frac{3}{4}$ yards cost?

10. At $\frac{1}{2}$ a cent apiece, how many marbles can I buy for $\frac{1}{4}$ of a dollar?

11. From 2 bushels of potatoes there were taken at one time $2\frac{1}{2}$ pecks, and at another time $3\frac{3}{4}$ pecks. How many pecks remained?



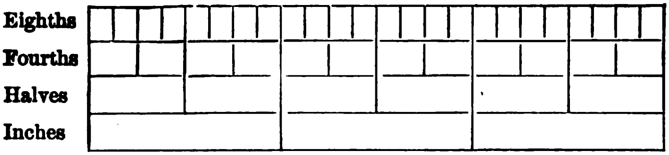




1. How many eighths = one-half?
2. How many eighths = one-fourth?
3. Three-eighths from 1 = what?

With disks find:

4. $\frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8} = ?$ $\frac{1}{8} + \frac{1}{8} = ?$
5. $\frac{1}{4} + \frac{1}{8} = ?$ $\frac{1}{2} + \frac{1}{8} = ?$ $\frac{3}{4} + \frac{1}{8} = ?$
6. $1 - \frac{1}{8} = ?$ $1 - \frac{3}{8} = ?$ $1 - \frac{5}{8} = ?$
7. $\frac{1}{2} - \frac{1}{8} = ?$ $\frac{1}{4} - \frac{1}{8} = ?$ $\frac{3}{4} - \frac{1}{8} = ?$
8. $\frac{7}{8} - \frac{1}{4} = ?$ $\frac{7}{8} - \frac{3}{4} = ?$ $\frac{3}{4} - \frac{3}{8} = ?$
9. 2 times $\frac{1}{8}$ = how many fourths?
10. 4 times $\frac{1}{8}$ = how many halves?
11. 2 times $\frac{2}{8}$ = how many halves?
12. 2 times $\frac{3}{8}$ = how many fourths?
13. $\frac{7}{8} + \frac{1}{8}$? $\frac{7}{8} + \frac{1}{4} = ?$ $\frac{7}{8} + \frac{1}{2} = ?$
14. $1\frac{1}{4}$ is ? larger than $1\frac{1}{8}$?
15. What is $\frac{1}{2}$ of $\frac{1}{4}$? $\frac{1}{2}$ of $\frac{3}{4}$? $\frac{1}{4}$ of $\frac{1}{2}$?
16. $\frac{1}{8}$ is contained in $\frac{1}{4}$ how many times?
17. $\frac{1}{8}$ is contained in $\frac{1}{2}$ how many times?
18. $\frac{3}{8}$ is contained in $\frac{3}{4}$ how many times?
19. $\frac{5}{8}$ is contained in $1\frac{1}{4}$ how many times?
20. $4 \div \frac{1}{2} = ?$ $2 \div \frac{1}{4} = ?$ $3 \div \frac{3}{4} = ?$
21. $2 \div \frac{1}{8} = ?$ $\frac{3}{4} \div \frac{3}{8} = ?$ $1\frac{1}{4} \div \frac{5}{8} = ?$



1. In 1 inch how many fourths? how many eighths?
2. In $\frac{1}{2}$ inch how many fourths? how many eighths?
3. In $\frac{1}{4}$ inch how many eighths?
4. In $1\frac{1}{2}$ inches how many fourths? how many eighths?
5. In $1\frac{1}{4}$ inches how many eighths?
6. $\frac{1}{4}$ in. + $\frac{1}{4}$ in. = ? $\frac{1}{4}$ in. + $\frac{1}{8}$ in. = ? $\frac{1}{2}$ in. + $\frac{1}{8}$ in. = ?
7. $\frac{1}{2}$ in. + $\frac{3}{8}$ in. = ? $\frac{1}{2}$ in. + $\frac{5}{8}$ in. = ? $\frac{1}{4}$ in. + $\frac{3}{8}$ in. = ?
8. 2 times $\frac{1}{8}$ in. = how many fourths of an inch?
9. 4 times $\frac{1}{8}$ in. = how many halves of an inch?
10. 2 times $\frac{3}{8}$ in. = how many fourths of an inch?
11. 2 times $\frac{3}{8}$ in. = ? 4 times $\frac{3}{8}$ in. = ?
12. $\frac{1}{2}$ of $\frac{1}{4}$ = ? $\frac{1}{2}$ of $\frac{3}{4}$ = ? $\frac{1}{4}$ of $\frac{1}{2}$ = ?
13. $\frac{1}{8}$ in. is contained in $\frac{1}{2}$ in. how many times?
14. $\frac{1}{8}$ in. is contained in $\frac{1}{4}$ in. how many times?
15. $\frac{1}{8}$ in. is contained in $\frac{3}{4}$ in. how many times?
16. $\frac{3}{8}$ in. is contained in $\frac{3}{4}$ in. how many times?
17. $\frac{1}{2}$ of $\frac{1}{4}$ in. = ? $\frac{1}{4}$ of $\frac{1}{2}$ in. = ? $\frac{1}{2}$ of $\frac{3}{4}$ in. = ?
18. $\frac{3}{4}$ of 2 in. = ? $\frac{1}{2}$ of $1\frac{1}{4}$ in. = ? $\frac{3}{4}$ of $1\frac{1}{2}$ in. = ?

19.

$1 - \frac{1}{8}$
$1 - \frac{7}{8}$
$1 - \frac{4}{8}$
$\frac{4}{8} + \frac{4}{8}$
$\frac{3}{8} + \frac{5}{8}$

20.

$\frac{3}{8} + \frac{6}{8}$
$\frac{7}{8} + \frac{3}{8}$
$1\frac{1}{8} + \frac{6}{8}$
$1\frac{7}{8} - \frac{4}{8}$
$1\frac{1}{8} - \frac{3}{8}$

21.

$1\frac{1}{8} + \frac{5}{8}$
$1\frac{6}{8} - \frac{5}{8}$
$2 - \frac{3}{8}$
$\frac{7}{8} + \frac{4}{8}$
$1\frac{3}{8} + \frac{7}{8}$

22.

$5\frac{3}{8} + \frac{5}{8}$
$4\frac{7}{8} + 1\frac{5}{8}$
$6\frac{3}{8} - 1\frac{1}{8}$
$2\frac{1}{8} - \frac{3}{8}$
$1\frac{1}{8} - \frac{7}{8}$

23.

$7\frac{1}{8} - \frac{3}{8}$
$1\frac{2}{8} + 5\frac{6}{8}$
$41\frac{1}{8} - 3\frac{1}{8}$
$12\frac{3}{8} + 9\frac{6}{8}$
$7\frac{4}{8} - 3\frac{7}{8}$

1. Express in lower terms: $\frac{4}{8}$; $\frac{6}{8}$; $\frac{2}{8}$; $1\frac{6}{8}$; $\frac{2}{4}$; $3\frac{4}{8}$; $2\frac{2}{8}$; $4\frac{6}{8}$.

2. Give fractional combinations in halves, fourths, and eighths of the following numbers: 1; $\frac{1}{2}$; $\frac{3}{4}$; $\frac{7}{8}$; $1\frac{1}{4}$; $1\frac{1}{8}$; $1\frac{1}{2}$; $1\frac{7}{8}$; 3; $4\frac{7}{8}$.

3. Express in whole or mixed numbers and reduce to lowest terms the following: $\frac{8}{4}$; $\frac{10}{8}$; $\frac{27}{4}$; $\frac{30}{8}$; $\frac{48}{4}$; $\frac{27}{2}$; $\frac{65}{8}$; $\frac{66}{8}$; $\frac{64}{4}$; $\frac{78}{8}$.

4. How many eighths in the following: $\frac{1}{2}$? $\frac{3}{4}$? $\frac{2}{4}$? $1\frac{1}{2}$? $3\frac{3}{8}$? $4\frac{1}{4}$? $6\frac{3}{4}$? $1\frac{3}{4}$? $7\frac{1}{4}$? $3\frac{1}{2}$?

5. Show by lines: $\frac{3}{4}$; $\frac{3}{8}$; $\frac{6}{8}$; $1\frac{1}{8}$. The denominator shows what? The numerator shows what?

6.	**7.**	**8.**	**9.**	**10.**
$\frac{3}{8} + \frac{1}{4}$	$2\frac{1}{2} - \frac{1}{8}$	$2\frac{1}{4} - \frac{5}{8}$	$4\frac{1}{2} + 6\frac{1}{4}$	$13\frac{1}{4} + 6\frac{1}{2}$
$\frac{7}{8} + \frac{1}{4}$	$5\frac{1}{4} - \frac{3}{8}$	$3\frac{1}{8} - \frac{3}{4}$	$8\frac{1}{4} + 3\frac{1}{8}$	$8\frac{1}{4} - 1\frac{3}{4}$
$1\frac{3}{4} + \frac{1}{8}$	$\frac{3}{4} + 1\frac{7}{8}$	$5\frac{1}{2} - \frac{7}{8}$	$5\frac{3}{8} + 4\frac{1}{4}$	$6\frac{1}{2} - 2\frac{3}{4}$
$1\frac{1}{4} + \frac{3}{8}$	$1\frac{7}{8} + 1\frac{1}{2}$	$1\frac{3}{4} + 1\frac{7}{8}$	$7\frac{5}{8} + 3\frac{3}{8}$	$12\frac{5}{8} + 3\frac{3}{4}$
$3\frac{1}{2} + \frac{3}{4}$	$3\frac{1}{4} - 1\frac{1}{8}$	$1\frac{7}{8} + 1\frac{3}{4}$	$8\frac{1}{4} - 1\frac{3}{8}$	$6\frac{3}{8} + 7\frac{1}{2}$
$4\frac{1}{2} + \frac{7}{8}$	$2\frac{1}{2} - \frac{7}{8}$	$1\frac{3}{8} - 1\frac{1}{4}$	$6\frac{1}{8} - 1\frac{1}{4}$	$7\frac{1}{2} - 3\frac{5}{8}$
$3\frac{3}{4} + \frac{3}{8}$	$12\frac{1}{2} - 1\frac{7}{8}$	$4 - 1\frac{1}{2}$	$5\frac{3}{8} - 2\frac{1}{2}$	$6\frac{7}{8} + 3\frac{3}{4}$
$6\frac{5}{8} + \frac{3}{4}$	$\frac{7}{8} + 5\frac{3}{4}$	$3 - 1\frac{5}{8}$	$11\frac{5}{8} - 2\frac{3}{4}$	$8\frac{3}{4} - 7\frac{1}{2}$

11.	**12.**	**13.**	**14.**	**15.**
$\frac{1}{8} \times 2$	$2 \times 2\frac{1}{2}$	$\frac{1}{4}$ of 2	$\frac{1}{2}$ of $\frac{1}{2}$	$\frac{1}{4}$ of 3
$\frac{3}{8} \times 4$	$4 \times 6\frac{1}{8}$	$\frac{1}{8}$ of 12	$\frac{1}{2}$ of $\frac{1}{4}$	$\frac{1}{2}$ of $3\frac{1}{2}$
$\frac{5}{8} \times 8$	$12 \times 7\frac{1}{4}$	$\frac{1}{8}$ of 4	$\frac{1}{4}$ of $\frac{1}{2}$	$\frac{1}{4}$ of $3\frac{1}{2}$
$1\frac{1}{8} \times 6$	$16 \times 1\frac{3}{4}$	$\frac{3}{8}$ of 8	$\frac{1}{2}$ of $\frac{3}{4}$	$\frac{3}{4}$ of 3
$7\frac{1}{4} \times 4$	$8 \times 2\frac{3}{8}$	$\frac{3}{4}$ of 16	$\frac{3}{4}$ of $\frac{1}{2}$	$\frac{3}{4}$ of 5
$8\frac{3}{8} \times 4$	$6 \times 4\frac{1}{2}$	$\frac{3}{8}$ of 40	$\frac{1}{2}$ of $1\frac{1}{2}$	$\frac{1}{2}$ of $3\frac{1}{2}$
$1\frac{7}{8} \times 6$	$24 \times 1\frac{7}{8}$	$\frac{7}{8}$ of 40	$\frac{1}{4}$ of $1\frac{1}{2}$	$\frac{3}{4}$ of $1\frac{1}{2}$
$1\frac{5}{8} \times 12$	$12 \times 3\frac{3}{4}$	$\frac{5}{8}$ of 48	$\frac{1}{2}$ of $1\frac{1}{4}$	$\frac{3}{4}$ of $2\frac{1}{2}$

1.
$1 \div 4$
$3 \div 4$
$1 \div 8$
$6 \div 8$
$7 \div 8$
$5 \div 8$
$\frac{1}{2} \div 2$
$\frac{1}{2} \div 4$
$2\frac{1}{2} \div 2$
$4\frac{1}{2} \div 4$

2.
$2\frac{1}{2} \div 2$
$4\frac{1}{2} \div 4$
$6\frac{1}{2} \div 2$
$6\frac{1}{2} \div 4$
$\frac{1}{4} \div 2$
$2\frac{1}{4} \div 2$
$1\frac{1}{2} \div 2$
$1\frac{1}{2} \div 4$
$2\frac{1}{2} \div 4$
$3\frac{1}{2} \div 4$

3.
$6\frac{1}{2} \div 2$
$5\frac{1}{2} \div 2$
$5\frac{1}{2} \div 4$
$7\frac{1}{2} \div 4$
$2\frac{1}{4} \div 2$
$4\frac{1}{4} \div 2$
$3\frac{1}{4} \div 2$
$5\frac{1}{4} \div 2$
$7\frac{1}{4} \div 2$
$9\frac{1}{2} \div 4$

4.
$7\frac{1}{2} \div 4$
$11\frac{1}{2} \div 4$
$3\frac{1}{2} \div 2$
$7\frac{1}{2} \div 2$
$13\frac{1}{2} \div 2$
$16\frac{1}{2} \div 4$
$17\frac{1}{2} \div 4$
$18\frac{1}{4} \div 2$
$15\frac{1}{4} \div 2$
$21\frac{1}{2} \div 4$

5.
$1\frac{1}{4} \div 2$
$3\frac{1}{2} \div 4$
$1\frac{1}{2} \div 4$
$5\frac{1}{4} \div 2$
$7\frac{1}{2} \div 4$
$29\frac{1}{2} \div 4$
$17\frac{1}{2} \div 2$
$22\frac{1}{4} \div 2$
$21\frac{1}{2} \div 4$
$27\frac{1}{2} \div 4$

6.
$1 \div \frac{1}{2}$
$2 \div \frac{1}{2}$
$4 \div \frac{1}{2}$
$1 \div \frac{1}{4}$
$2 \div \frac{1}{4}$
$4 \div \frac{1}{4}$
$8 \div \frac{1}{4}$
$10 \div \frac{1}{4}$
$8 \div \frac{1}{2}$
$12 \div \frac{1}{2}$

7.
$1 \div \frac{1}{8}$
$3 \div \frac{1}{4}$
$2 \div \frac{1}{8}$
$3 \div \frac{1}{8}$
$6 \div \frac{1}{8}$
$1\frac{1}{2} \div \frac{1}{2}$
$2\frac{1}{2} \div \frac{1}{2}$
$\frac{1}{2} \div \frac{1}{4}$
$1\frac{1}{2} \div \frac{1}{4}$
$2\frac{1}{2} \div \frac{1}{4}$

8.
$\frac{1}{2} \div \frac{1}{8}$
$1\frac{1}{2} \div \frac{1}{8}$
$2\frac{1}{2} \div \frac{1}{8}$
$3\frac{1}{2} \div \frac{1}{2}$
$7\frac{1}{2} \div \frac{1}{2}$
$4\frac{1}{2} \div \frac{1}{4}$
$6\frac{1}{2} \div \frac{1}{8}$
$3\frac{1}{4} \div \frac{1}{2}$
$4\frac{1}{4} \div \frac{1}{4}$
$6\frac{3}{4} \div \frac{1}{2}$

9.
$6\frac{1}{2} \div \frac{1}{4}$
$6\frac{1}{4} \div \frac{1}{4}$
$4\frac{3}{8} \div \frac{1}{2}$
$8\frac{7}{8} \div \frac{1}{2}$
$9\frac{1}{4} \div \frac{1}{8}$
$4\frac{3}{4} \div \frac{1}{2}$
$4\frac{7}{8} \div \frac{1}{4}$
$3\frac{1}{2} \div \frac{1}{8}$
$3\frac{3}{4} \div \frac{1}{8}$
$6\frac{1}{8} \div \frac{1}{4}$

10.
$7 \div \frac{1}{8}$
$7\frac{1}{2} \div \frac{1}{8}$
$14\frac{3}{4} \div \frac{1}{8}$
$12\frac{3}{4} \div \frac{1}{4}$
$16\frac{1}{2} \div \frac{1}{4}$
$12\frac{5}{8} \div \frac{1}{8}$
$2\frac{5}{8} \div \frac{1}{4}$
$5\frac{3}{8} \div \frac{1}{2}$
$10\frac{3}{4} \div \frac{1}{8}$
$14\frac{1}{2} \div \frac{1}{8}$

11. From a barrel of vinegar containing 38 gallons there was sold $26\frac{5}{8}$ gallons. What is the value of the remainder at 24 cents a gallon?

12. John started from a certain place and walked due north $6\frac{3}{4}$ miles, and James walked south from the same place $4\frac{3}{8}$ miles. How far apart were the places where their walks ended?

1. A man had $1\frac{1}{2}$ acres of land and he bought $2\frac{3}{4}$ acres more. How many acres had he then?

2. What part of a peck is 1 quart? 3 quarts? 2 quarts? 6 quarts? 7 quarts?

3. What part of a gallon is 2 quarts? 3 quarts? 1 pint? 3 pints? 2 quarts and a pint?

4. James has 48 cents and his brother John has $\frac{3}{4}$ as much. James has how many cents more than John?

5. From a lot of land containing $\frac{3}{4}$ of an acre, $\frac{3}{8}$ of an acre was sold. How much land was left?

6. At $\$\frac{7}{8}$ a bushel, what do I pay for 14 bushels of potatoes?

7. At $\frac{1}{4}$ of a dollar a bushel, how many bushels of apples can I buy for $4? for $12?

8. At $37\frac{1}{2}$¢ a gallon, how much will a barrel of molasses cost, the barrel containing 34 gal.?

9. 3 apples are $\frac{1}{2}$ of how many apples? (Show by drawing.)

10. 6 books are $\frac{3}{4}$ of how many books? (Show by drawing.)

11. Gave 2¢ for a pencil, which is $\frac{1}{2}$ of what I gave for an orange. What was the cost of the orange?

12. If $\frac{1}{2}$ of a yard of cloth costs 20¢, what will 2 yd. cost? $3\frac{1}{2}$ yd.? $4\frac{1}{8}$ yd.?

13. If $\frac{3}{4}$ of a pound of tea costs 30¢, what is the cost of $\frac{1}{4}$ lb.? of 1 lb.? of $2\frac{1}{4}$ lb.?

14. If $\frac{3}{8}$ of a bushel of apples costs 60¢, what is the cost of 1 bushel? of $2\frac{3}{4}$ bushels?

15. If $\frac{3}{4}$ of a barrel of flour costs $6, what will $\frac{3}{8}$ of a barrel cost at the same rate?

1. Roy's home is $\frac{3}{8}$ of a mile east of the school-house, and Robert's is $\frac{3}{4}$ of a mile west. How many miles will Roy walk in walking to Robert's house and back?

2. At 26 ¢ a peck, what will $1\frac{3}{8}$ bu. of potatoes cost?

3. If I can buy 8 lb. of brown sugar for 50 ¢, what ought I to pay for 3 lb.?

4. If $\frac{1}{2}$ yd. of cloth costs $\frac{1}{4}$ of a dollar, what should I pay for $4\frac{1}{2}$ yd.?

5. A market-man sold $\frac{3}{4}$ of his produce for $12. What ought he to sell the rest for at the same rate?

6. Which is the greater, $\frac{3}{4}$ of 16 or $\frac{3}{8}$ of 32, and how much greater?

7. Which is the greater, $\frac{3}{4}$ of 12 or $\frac{7}{8}$ of 16, and how much greater?

8. What is the difference between $\frac{1}{2}$ of $1\frac{1}{2}$ and $\frac{3}{4}$ of 1?

9. From a piece of cloth measuring $60\frac{1}{2}$ yd. there were cut 3 patterns of $16\frac{1}{4}$ yd. each. How many yards remained?

10. How many yards of cloth at $\$\frac{1}{8}$ a yard can be bought for $5? $\$2\frac{1}{2}$? $8? $\$12\frac{1}{2}$?

11. If it takes $\frac{1}{4}$ of a yard of cloth to make an apron, how many aprons can be made from 6 yards?

12. In $3\frac{3}{4}$ lb. how many ounces?

13. At $\frac{3}{4}$ of a cent apiece, what will 2 dozen eggs cost?

14. I divided $1\frac{1}{4}$ lb. of candy among 5 boys. How many ounces did each boy have?

15. If $\frac{1}{2}$ yd. of cloth costs 60 ¢, how much will 1 yd. cost? $4\frac{3}{4}$ yd.?

16. I pay 6 cents for $\frac{1}{2}$ quart of berries. How much must I pay for a peck at the same rate?

Written Exercises.

1.
$81\frac{3}{4} + 46\frac{1}{2}$
$35\frac{3}{8} + 27\frac{1}{4}$
$86\frac{1}{2} - 43\frac{3}{4}$
$47\frac{1}{4} + 10\frac{7}{8}$
$53\frac{3}{4} + 16\frac{1}{8}$

2.
$80 - 71\frac{3}{4}$
$86\frac{1}{4} - 43\frac{1}{8}$
$37\frac{1}{8} \times 14$
$56\frac{7}{8} + 48\frac{3}{4}$
$80\frac{3}{4} \div \frac{1}{2}$

3.
$120 \div 7\frac{2}{4}$
$15\frac{1}{2} \times 12\frac{1}{4}$
$48\frac{3}{8} + 127\frac{3}{4}$
$108\frac{1}{2} \div \frac{1}{8}$
$36\frac{1}{4} \times 27\frac{1}{2}$

4.
$13\frac{3}{4} \times 16\frac{1}{2}$
$128\frac{1}{4} - 65\frac{7}{8}$
$160\frac{7}{8} + 18\frac{3}{4}$
$114\frac{3}{4} \div \frac{1}{2}$
$148\frac{1}{8} - 29\frac{3}{4}$

5.
$44\frac{3}{4} + 86\frac{5}{8}$
$74\frac{1}{4} - 18\frac{3}{8}$
$12\frac{1}{2} \div \frac{1}{4}$
$20\frac{3}{4} \times 12\frac{1}{2}$
$116\frac{1}{8} - 66\frac{3}{4}$

6.
$600 \div \frac{1}{8}$
$37\frac{1}{2} \times 14\frac{1}{4}$
$200\frac{1}{2} - 36\frac{5}{8}$
$45\frac{3}{4} \times 20$
$7\frac{1}{8} \times 100$

7.
$34\frac{1}{8} - 17\frac{1}{2}$
$27\frac{3}{4} + 68\frac{7}{8}$
$125\frac{1}{4} - 66\frac{5}{8}$
$17\frac{1}{4} \times 20\frac{1}{2}$
$6\frac{3}{4} \times 200\frac{1}{2}$

8.
$80\frac{3}{4} - 19\frac{7}{8}$
$69\frac{1}{2} - 17\frac{3}{8}$
$15\frac{1}{4} \times 16\frac{1}{2}$
$80\frac{1}{2} \div \frac{1}{4}$
$27\frac{7}{8} + 18\frac{3}{4}$

9.
$140 \times 16\frac{7}{8}$
$80\frac{1}{8} - 29\frac{3}{4}$
$76\frac{1}{2} \times 12\frac{3}{4}$
$180 \div \frac{1}{4}$
$16\frac{1}{2} \div \frac{1}{2}$

10.
$124\frac{3}{8} + 27\frac{3}{4}$
$89\frac{1}{2} + 17\frac{7}{8}$
$63\frac{3}{4} \times 1\frac{1}{2}$
$186 \times 14\frac{7}{8}$
$58 \div \frac{1}{4}$

11.
$100\frac{1}{8} - 69\frac{3}{4}$
$37\frac{3}{4} + 28\frac{3}{8}$
$36\frac{4}{8} - 20\frac{1}{2}$
$7\frac{7}{8} \times 1000$
$63\frac{1}{2} \times 27$

12.
$40\frac{1}{8} \div \frac{1}{2}$
$87 - 59\frac{7}{8}$
$23\frac{3}{4} \times 16$
$85\frac{6}{8} + 13\frac{3}{4}$
$36\frac{1}{4} \div \frac{1}{2}$

13. A grocer sold $118\frac{3}{4}$ lb. of sugar to one customer, $206\frac{7}{8}$ lb. to another, and $130\frac{1}{2}$ lb. to another. How many pounds did he sell to the three customers?

14. I paid $\$284\frac{3}{4}$ for a quantity of wheat, and sold it at a profit of $\$18\frac{7}{8}$. What did I sell it for?

15. A man had $24\frac{1}{2}$ acres of land which he divided into building lots, each containing $\frac{1}{4}$ of an acre. How many building lots did he have?

1. How many books at $¼ apiece can I buy for $20½?

2. Bought 20½ acres of land at $30¼ an acre, and paid for it in wheat at ½ of a dollar a bushel. How many bushels of wheat did it take to pay for the land?

3. Bought a barrel of kerosene oil containing 42 gallons for $5¾. I sold it for 15½ cents a gallon. What did I gain?

4. If a man walks 3¾ miles an hour, how many miles can he walk in 8 hours at the same rate?

5. A horse traveled 24½ miles in 4 hours. What was his average time per mile?

6. If a train moves ⅜ of a mile in a minute, what is its rate per hour? How far will it go in 74½ hours at the same rate?

7. If 4 tons of coal cost $25½, what will 42 tons cost?

8. If an orange is worth three times as much as an apple, how many times as much as the apple are both together worth? Suppose both together are worth 8 cents, what is the apple worth?

9. A horse and carriage are worth $860. If the horse is worth three times as much as the carriage, what is each worth?

What is the cost of

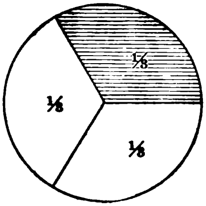
10. 364 bbl. flour @ $4⅜?
11. 206 yd. cloth @ $⅝?
12. 86½ lb. cheese @ 8¾¢?
13. 64½ lb. butter @ 42¾¢?
14. 406½ bu. potatoes @ 62½¢?
15. 18¾ T coal @ $5.37½?

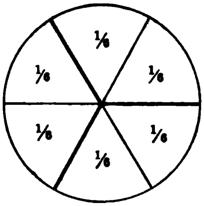
What is the cost of

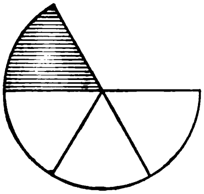
16. 642½ bu. wheat @ 87½¢?
17. 86 yd. velvet @ $3⅝?
18. 42¼ doz. eggs @ 18¢?
19. 6¼ cwt. ice @ 25¢?
20. 8⅜ acres land @ $140?
21. 12¾ bbl. apples @ $2.70?

SECTION IV.

Oral and Sight Exercises to Twelfths.



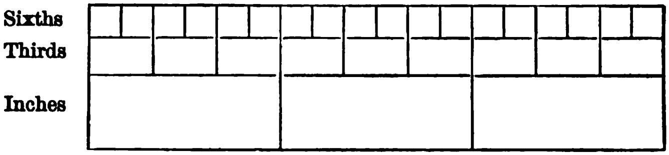




1. In one circle there are — thirds.
2. In one circle there are — sixths.
3. In one-third of a circle there are — sixths.
4. In two-thirds of a circle there are — sixths.
5. In one-half of a circle there are — sixths.
6. Two-thirds less one-sixth equal — —.

With disks and drawings find :

7. $\frac{1}{3}+\frac{1}{3}=?$ $\frac{1}{6}+\frac{1}{6}+\frac{1}{6}+\frac{1}{6}=?$
8. $\frac{1}{6}+\frac{1}{6}+\frac{1}{6}=?$ $\frac{1}{6}+\frac{1}{6}=?$ $\frac{1}{3}+\frac{1}{6}=?$
9. $\frac{2}{3}+\frac{1}{6}=?$ $\frac{1}{2}+\frac{1}{6}=?$ $\frac{1}{2}+\frac{1}{3}=?$
10. $1-\frac{2}{3}=?$ $\frac{2}{3}-\frac{1}{6}=?$ $\frac{5}{6}-\frac{1}{3}=?$
11. $\frac{2}{3}-\frac{1}{6}=?$ $\frac{2}{3}-\frac{1}{2}=?$ $\frac{5}{6}-\frac{2}{3}=?$
12. $\frac{1}{2}$ of $\frac{1}{3}=?$ $\frac{1}{2}$ of $\frac{2}{3}=?$ $\frac{1}{3}$ of $\frac{1}{2}=?$
13. 2 times $\frac{1}{6}$ = how many thirds?
14. 4 times $\frac{1}{6}$ = how many thirds?
15. 2 times $\frac{2}{6}$ = how many thirds?
16. $\frac{1}{6}$ is contained in $\frac{1}{2}$ how many times?
17. $\frac{1}{6}$ is contained in $\frac{1}{3}$ how many times?



1. In 1 inch there are how many thirds of an inch? How many sixths of an inch?

2. In $1\frac{1}{3}$ inches there are how many thirds of an inch?

3. How many sixths in one-third? in two-thirds?

4. How many inches in 8 thirds of an inch?

5. How many inches in 8 sixths of an inch? in 14 sixths of an inch?

6. Compare 1 half of an inch with 3 sixths of an inch by measuring.

7. $\frac{1}{3}$ in. $+$ $\frac{1}{3}$ in. $=$? $1\frac{1}{3}$ in. $+$ $\frac{2}{3}$ in. $=$? $1\frac{2}{3}$ in. $+$ $1\frac{2}{3}$ in. $=$?

8. $\frac{1}{3}$ in. $+$ $\frac{1}{6}$ in. $=$? $\frac{2}{3}$ in. $+$ $\frac{1}{6}$ in. $=$? $1\frac{2}{3}$ in. $+$ $1\frac{1}{6}$ in. $=$?

9. $\frac{1}{3}$ in. $+$ $\frac{3}{6}$ in. $=$? $\frac{2}{3}$ in. $+$ $\frac{4}{6}$ in. $=$? $1\frac{2}{3}$ in. $+$ $\frac{5}{6}$ in. $=$?

10. 1 in. $-$ $\frac{1}{3}$ in. $=$? $\frac{2}{3}$ in. $-$ $\frac{1}{6}$ in. $=$? $\frac{2}{3}$ in. $-$ $\frac{3}{6}$ in. $=$?

11. 2 in. $-$ $1\frac{5}{6}$ in. $=$? $\frac{5}{6}$ in. $-$ $\frac{1}{3}$ in. $=$? $1\frac{5}{6}$ in. $-$ $\frac{2}{3}$ in. $=$?

12. $1\frac{1}{6}$ in. $-$ $\frac{2}{6}$ in. $=$? $1\frac{1}{6}$ in. $-$ $\frac{1}{3}$ in. $=$? $1\frac{1}{3}$ in. $-$ $\frac{5}{6}$ in. $=$?

13. $1\frac{1}{3}$ in. $\times 2 =$? $\frac{2}{3}$ in. $\times 3 =$? $\frac{5}{6}$ in. $\times 2 =$?

14. $\frac{2}{3}$ in. $\times 6 =$? $\frac{5}{6}$ in. $\times 3 =$? $1\frac{3}{6}$ in. $\times 2 =$?

15. $\frac{1}{3}$ in. is contained in 1 in. how many times?

16. $\frac{2}{3}$ in. is contained in $2\frac{2}{3}$ in. how many times?

17. $\frac{5}{6}$ in. is contained in $1\frac{2}{3}$ in. how many times?

18. $\frac{1}{2}$ of $\frac{2}{3}$ in. $=$? $\frac{1}{3}$ of $\frac{3}{6}$ in. $=$? $\frac{1}{2}$ of $\frac{1}{3}$ in. $=$?

19. Express in other denominations: $\frac{1}{3}$ of a foot; $\frac{1}{3}$ of a yard; $\frac{1}{3}$ of a gallon; $\frac{1}{3}$ of a bushel; $\frac{1}{3}$ of a peck; $\frac{1}{3}$ of a pint; $\frac{1}{3}$ of a dozen; $\frac{1}{3}$ of a quire; $\frac{1}{3}$ of a week; $\frac{1}{6}$ of a foot; $\frac{1}{6}$ of a dozen; $\frac{2}{3}$ of a foot; $\frac{4}{6}$ of a foot.

1.	**2.**	**3.**	**4.**	**5.**
$\frac{1}{3}+\frac{1}{3}$	$1+1\frac{1}{3}$	$1-\frac{1}{3}$	$6\frac{1}{3}+2\frac{1}{3}$	$20-8\frac{1}{3}$
$\frac{2}{3}+\frac{1}{3}$	$1\frac{1}{3}+3$	$\frac{2}{3}-\frac{1}{3}$	$6\frac{1}{3}-1\frac{1}{3}$	$8\frac{1}{3}+14\frac{2}{3}$
$\frac{1}{3}+\frac{2}{3}$	$1\frac{2}{3}+\frac{1}{3}$	$1\frac{2}{3}-\frac{1}{3}$	$4\frac{2}{3}+1\frac{1}{3}$	$9\frac{2}{3}+8\frac{2}{3}$
$1+\frac{1}{3}$	$2\frac{1}{3}+1\frac{1}{3}$	$1\frac{1}{3}-\frac{1}{3}$	$3\frac{2}{3}+1\frac{2}{3}$	$8\frac{1}{3}-6\frac{1}{3}$
$1\frac{2}{3}+\frac{1}{3}$	$2\frac{1}{3}+2\frac{2}{3}$	$1\frac{2}{3}-\frac{1}{3}$	$8-3\frac{2}{3}$	$6\frac{1}{3}-1\frac{2}{3}$
$1\frac{1}{3}+\frac{2}{3}$	$1\frac{2}{3}-1\frac{2}{3}$	$1\frac{1}{3}-\frac{1}{3}$	$5\frac{1}{3}-\frac{2}{3}$	$18-4\frac{2}{3}$
$1\frac{1}{3}+\frac{1}{3}$	$5\frac{2}{3}+4\frac{2}{3}$	$4\frac{1}{3}-\frac{2}{3}$	$16\frac{1}{3}+8\frac{2}{3}$	$7\frac{2}{3}+3\frac{2}{3}$
$\frac{2}{3}+\frac{2}{3}$	$6\frac{1}{3}+3\frac{2}{3}$	$3\frac{1}{3}-1$	$20-8\frac{2}{3}$	$20-3\frac{2}{3}$
$2+\frac{2}{3}$	$9\frac{2}{3}+6\frac{2}{3}$	$3\frac{1}{3}-1\frac{1}{3}$	$21\frac{1}{3}-16\frac{1}{3}$	$17\frac{2}{3}+8\frac{2}{3}$
$1\frac{1}{3}+1\frac{2}{3}$	$18\frac{2}{3}+6\frac{2}{3}$	$3\frac{1}{3}-1\frac{1}{3}$	$10\frac{2}{3}+6\frac{2}{3}$	$26\frac{1}{3}-9\frac{2}{3}$

6. Express in whole or mixed numbers the following fractions: $\frac{6}{3}$; $\frac{12}{3}$; $\frac{7}{3}$; $\frac{9}{3}$; $\frac{8}{3}$; $\frac{5}{3}$; $\frac{13}{3}$; $\frac{14}{3}$; $\frac{20}{3}$; $\frac{26}{3}$.

7. How many sixths in 1? in $\frac{1}{2}$? in $\frac{1}{3}$? in $\frac{2}{3}$?

8. How many halves or thirds in $\frac{6}{6}$? in $\frac{3}{6}$? in $\frac{2}{6}$? in $\frac{4}{6}$?

9. Give fractional combinations in halves, thirds, and sixths of the following numbers: 1 ($1=\frac{1}{2}+\frac{1}{2}=\frac{1}{3}+\frac{1}{3}+\frac{1}{3}$, etc.), $\frac{1}{2}$; $\frac{1}{3}$; $\frac{2}{3}$; $\frac{5}{6}$; $1\frac{1}{3}$.

10.	**11.**	**12.**	**13.**	**14.**
$\frac{1}{6}+\frac{1}{6}$	$1-\frac{1}{6}$	$\frac{1}{2}+\frac{1}{6}$	$\frac{1}{2}+\frac{1}{3}$	$1\frac{1}{3}+\frac{1}{6}$
$\frac{5}{6}+\frac{1}{6}$	$\frac{5}{6}-\frac{2}{6}$	$\frac{1}{2}-\frac{1}{6}$	$\frac{1}{2}+\frac{2}{3}$	$1\frac{1}{2}+\frac{1}{3}$
$\frac{3}{6}+\frac{1}{6}$	$\frac{6}{6}-\frac{3}{6}$	$\frac{1}{3}+\frac{1}{6}$	$\frac{1}{2}-\frac{1}{3}$	$1\frac{1}{2}-\frac{2}{3}$
$\frac{4}{6}+\frac{2}{6}$	$\frac{8}{6}-\frac{4}{6}$	$\frac{1}{3}-\frac{1}{6}$	$\frac{2}{3}-\frac{1}{2}$	$2\frac{1}{3}+\frac{1}{2}$
$\frac{3}{6}+\frac{3}{6}$	$1\frac{1}{6}+\frac{1}{6}$	$\frac{2}{3}+\frac{1}{6}$	$\frac{5}{6}-\frac{2}{3}$	$2\frac{1}{3}-\frac{1}{2}$
$\frac{4}{6}+\frac{3}{6}$	$1\frac{1}{6}-\frac{1}{6}$	$\frac{2}{3}-\frac{1}{6}$	$\frac{2}{3}+\frac{1}{2}$	$3\frac{1}{6}-\frac{1}{3}$
$\frac{5}{6}+\frac{4}{6}$	$1\frac{2}{6}-\frac{1}{6}$	$\frac{5}{6}-\frac{1}{3}$	$1\frac{1}{3}-\frac{1}{6}$	$3\frac{1}{6}-\frac{1}{2}$
$\frac{2}{6}+\frac{5}{6}$	$2-\frac{3}{6}$	$\frac{1}{3}+\frac{5}{6}$	$1\frac{5}{6}-\frac{1}{2}$	$4\frac{1}{2}+1\frac{1}{3}$
$1\frac{1}{6}+\frac{2}{6}$	$3-\frac{2}{6}$	$\frac{1}{2}+\frac{5}{6}$	$2-\frac{2}{3}$	$3\frac{2}{3}+6\frac{1}{2}$
$1\frac{2}{6}+\frac{4}{6}$	$2\frac{1}{6}+\frac{5}{6}$	$\frac{2}{3}+\frac{5}{6}$	$1\frac{1}{2}-\frac{1}{3}$	$8\frac{1}{6}-3\frac{2}{3}$

1.

$\frac{1}{6} \times 6$
$\frac{1}{6} \times 3$
$\frac{3}{6} \times 2$
$\frac{2}{6} \times 3$
$\frac{5}{6} \times 6$
$1\frac{1}{6} \times 4$
$2\frac{4}{6} \times 5$
$2\frac{5}{6} \times 3$
$2\frac{1}{6} \times 6$
$1\frac{5}{6} \times 8$

2.

$\frac{1}{3} \times 6$
$1\frac{1}{3} \times 3$
$1\frac{5}{6} \times 4$
$1\frac{2}{3} \times 2$
$1\frac{1}{6} \times 12$
$1\frac{1}{3} \times 9$
$2\frac{1}{2} \times 7$
$1\frac{3}{6} \times 5$
$\frac{5}{6} \times 8$
$2\frac{2}{6} \times 4$

3.

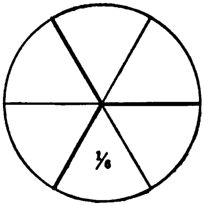
$\frac{1}{3}$ of 6
$\frac{1}{6}$ of 1
$\frac{1}{3}$ of $\frac{1}{2}$
$\frac{1}{6}$ of 2
$\frac{1}{3}$ of $1\frac{1}{2}$
$\frac{1}{6}$ of 4
$\frac{1}{2}$ of $\frac{1}{3}$
$\frac{1}{6}$ of 2
$\frac{1}{3}$ of $2\frac{1}{2}$
$\frac{1}{2}$ of $1\frac{1}{3}$

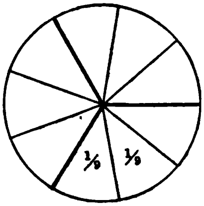
4.

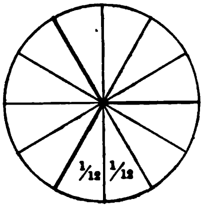
$1 \div 6$
$\frac{3}{6} \div 3$
$\frac{4}{6} \div 2$
$1\frac{1}{2} \div 2$
$1\frac{1}{2} \div 3$
$4 \div 6$
$4\frac{1}{2} \div 6$
$1\frac{1}{3} \div 2$
$2\frac{1}{3} \div 3$
$1\frac{2}{3} \div 2$

5.

$1 \div \frac{1}{3}$
$1 \div \frac{1}{6}$
$2 \div \frac{1}{6}$
$4 \div \frac{1}{6}$
$1\frac{1}{2} \div \frac{1}{2}$
$2\frac{1}{3} \div \frac{1}{3}$
$1\frac{1}{2} \div \frac{1}{4}$
$4\frac{1}{2} \div \frac{1}{2}$
$1\frac{1}{6} \div \frac{1}{6}$
$1\frac{2}{3} \div \frac{1}{6}$







6. $\frac{1}{2}$ of $\frac{1}{3} = ?$ $\frac{1}{3}$ of $\frac{1}{3} = ?$ $\frac{1}{4}$ of $\frac{1}{3} = ?$

7. How many ninths in one-third?

8. How many twelfths in one? in one-half? in one-fourth? in one-sixth?

With disks and drawings find:

9. $\frac{3}{6} + \frac{1}{6} = ?$ $\frac{4}{6} + \frac{1}{6} + \frac{1}{6} = ?$ $\frac{2}{3} + \frac{1}{6} = ?$

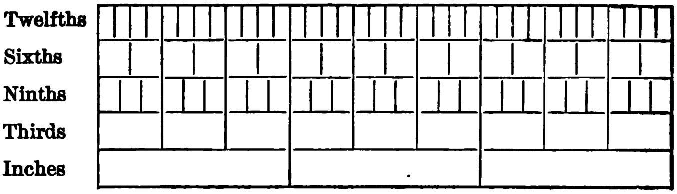
10. $\frac{2}{9} + \frac{1}{9} = ?$ $\frac{4}{9} + \frac{1}{9} + \frac{1}{9} = ?$ $\frac{2}{3} + \frac{1}{9} = ?$

11. $\frac{5}{12} + \frac{1}{12} = ?$ $\frac{6}{12} + \frac{1}{12} + \frac{1}{12} = ?$ $\frac{6}{12} + \frac{1}{12} + \frac{1}{12} + \frac{1}{12}$?

12. $\frac{1}{6} + \frac{1}{12} = ?$ $\frac{1}{3} + \frac{1}{6} + \frac{1}{12} = ?$ $\frac{1}{2} + \frac{1}{6} + \frac{1}{12} = ?$

13. $\frac{2}{3} - \frac{1}{9} = ?$ $\frac{7}{12} - \frac{1}{2} = ?$ $\frac{5}{6} - \frac{1}{3} = ?$

14. $\frac{11}{12} - \frac{5}{6} = ?$ $\frac{8}{9} - \frac{2}{3} = ?$ $\frac{1}{2} - \frac{1}{12} = ?$



1. How many ninths in $\frac{1}{3}$ in.? in $\frac{2}{3}$ in.? in $1\frac{1}{3}$ in.?
2. How many twelfths in $\frac{1}{3}$ in.? in $\frac{4}{6}$ in.? in $\frac{5}{6}$ in.?
3. How many sixths in $\frac{4}{12}$ in.? in $\frac{8}{12}$ in.?
4. How many thirds in $\frac{6}{9}$ in.? in $\frac{8}{12}$ in.?
5. $\frac{1}{3}$ in. + $\frac{1}{9}$ in. = ? $\frac{1}{3}$ in. + $\frac{1}{12}$ in. = ? $\frac{1}{3}$ in. + $\frac{4}{9}$ in. = ?
6. $\frac{1}{3}$ in. + $\frac{3}{12}$ in. = ? $\frac{1}{6}$ in. + $\frac{7}{12}$ in. = ? $\frac{5}{6}$ in. + $\frac{1}{12}$ in. = ?
7. $\frac{5}{6}$ in. + $\frac{4}{12}$ in. = ? $\frac{5}{6}$ in. + $\frac{7}{12}$ in. = ? $\frac{5}{6}$ in. + $\frac{9}{12}$ in. = ?
8. $1\frac{1}{3}$ in. − $\frac{1}{6}$ in. = ? $1\frac{2}{3}$ in. − $\frac{3}{6}$ in. = ? $\frac{5}{9}$ in. − $\frac{1}{3}$ in. = ?
9. $\frac{5}{6}$ in. − $\frac{7}{12}$ in. = ? $\frac{11}{12}$ in. − $\frac{5}{6}$ in. = ? $\frac{10}{12}$ in. − $\frac{2}{3}$ in. = ?
10. $\frac{1}{6}$ in. × 3 = ? $\frac{5}{6}$ in. × 2 = ? $\frac{3}{6}$ in. × 3 = ?
11. $1\frac{2}{9}$ in. × 3 = ? $\frac{4}{9}$ in. × 2 = ? $\frac{3}{9}$ in. × 4 = ?
12. What is $\frac{1}{3}$ of 2 in.? $\frac{1}{3}$ of $1\frac{1}{2}$ in.? $\frac{1}{3}$ of $\frac{1}{3}$ in.?
13. How many times is $\frac{1}{3}$ in. contained in 2 in.?
14. How many times is $\frac{2}{9}$ in. contained in $\frac{2}{3}$ in.?
15. How many times is $\frac{1}{12}$ in. contained in $\frac{1}{3}$ in.?
16. How many times is $\frac{5}{12}$ in. contained in $\frac{5}{6}$ in.?

With disks and drawings find :

17. $\frac{8}{9} - \frac{1}{3} = ?$ $\frac{7}{9} - \frac{2}{3} = ?$ $\frac{2}{3} - \frac{1}{9} = ?$
18. $\frac{1}{9} \times 3 = ?$ $\frac{1}{9} \times 6 = ?$ $\frac{1}{12} \times 2 = ?$
19. $\frac{1}{12} \times 3 = ?$ $\frac{1}{12} \times 4 = ?$ $\frac{1}{12} \times 6 = ?$
20. $\frac{1}{3} \div 2 = ?$ $\frac{1}{3} \div 3 = ?$ $\frac{1}{3} \div 4 = ?$
21. $\frac{1}{3} \div \frac{1}{9} = ?$ $\frac{1}{3} \div \frac{1}{6} = ?$ $\frac{2}{3} \div \frac{1}{6} = ?$

1.

$\frac{1}{12}+\frac{1}{12}$
$\frac{5}{12}+\frac{4}{12}$
$\frac{6}{12}+\frac{7}{12}$
$\frac{9}{12}+1\frac{5}{12}$
$1\frac{3}{12}+1\frac{4}{12}$
$\frac{1}{6}+\frac{1}{12}$
$1\frac{1}{2}+\frac{1}{12}$
$1\frac{2}{3}+\frac{1}{12}$
$1\frac{1}{12}+1\frac{2}{3}$

2.

$1-\frac{1}{12}$
$4-\frac{7}{12}$
$\frac{1}{2}-\frac{1}{12}$
$\frac{1}{3}-\frac{1}{12}$
$\frac{2}{3}-\frac{7}{12}$
$\frac{1}{4}+\frac{1}{12}$
$\frac{4}{12}-\frac{1}{4}$
$\frac{1}{3}-\frac{1}{4}$
$\frac{1}{2}-\frac{1}{4}$

3.

$\frac{1}{9}+\frac{1}{9}$
$\frac{4}{9}+\frac{3}{9}$
$\frac{1}{3}+\frac{1}{9}$
$\frac{1}{3}-\frac{1}{9}$
$\frac{2}{3}-\frac{4}{9}$
$1\frac{2}{3}-\frac{2}{9}$
$1\frac{2}{3}+\frac{7}{9}$
$1\frac{1}{9}-\frac{1}{3}$
$1\frac{5}{9}-\frac{2}{3}$

4.

$\frac{1}{12}\times 12$
$\frac{1}{12}\times 6$
$\frac{8}{12}\times 4$
$\frac{8}{12}\times 12$
$2\frac{1}{12}\times 12$
$1\frac{5}{6}\times 12$
$1\frac{3}{4}\times 12$
$2\frac{2}{3}\times 12$
$1\frac{2}{3}\times 6$

5.

$\frac{1}{12}$ of 4
$\frac{5}{12}$ of 4
$\frac{7}{12}$ of 3
$\frac{1}{2}$ of $\frac{1}{6}$
$\frac{1}{3}$ of $\frac{1}{6}$
$\frac{1}{2}$ of $1\frac{1}{6}$
$\frac{1}{3}$ of $\frac{1}{4}$
$\frac{1}{4}$ of $1\frac{1}{3}$
$\frac{1}{3}$ of $\frac{1}{3}$

6.

$4\frac{1}{3}\times 4$
$1\frac{1}{2}\times 2$
$1\frac{1}{2}\times\frac{1}{2}$
$1\frac{1}{2}\times 8$
$3\frac{1}{3}\times\frac{1}{2}$
$3\times 2\frac{1}{2}$
$1\frac{1}{4}\times 2$
$1\frac{1}{4}\times 8$
$1\frac{3}{4}\times 2$

7.

$2\frac{1}{2}\times 4$
$2\frac{1}{2}\times 4$
$3\frac{1}{3}\times 2$
$4\frac{1}{4}\times 3$
$6\frac{1}{4}\times\frac{1}{3}$
$2\frac{1}{4}\times 8$
$1\frac{3}{4}\times 4$
$6\frac{2}{3}\times 2$
$12\times 2\frac{1}{3}$

8.

$4\times 4\frac{3}{4}$
$2\frac{1}{2}\times 6$
$7\times 1\frac{1}{2}$
$3\frac{1}{2}\times 4\frac{3}{4}$
$6\times 4\frac{1}{2}$
$7\frac{1}{3}\times 2$
$3\frac{1}{4}\times 3$
$8\frac{3}{4}\times 6$
$4\frac{1}{2}\times 4$

9.

$1\div 12$
$\frac{5}{12}\div 5$
$\frac{1}{2}\div 6$
$\frac{1}{6}\div 2$
$\frac{1}{4}\div 3$
$\frac{1}{3}\div 4$
$1\frac{1}{2}\div 3$
$1\frac{1}{2}\div 6$
$2\frac{1}{3}\div 4$

10.

$1\div\frac{1}{12}$
$4\div\frac{1}{12}$
$10\div\frac{1}{12}$
$\frac{1}{2}\div\frac{1}{6}$
$\frac{1}{3}\div\frac{1}{6}$
$4\div\frac{1}{8}$
$1\frac{1}{4}\div 4$
$1\frac{1}{2}\div\frac{1}{6}$
$\frac{2}{3}\div\frac{1}{6}$

11.

$8\frac{1}{2}+6\frac{3}{4}$
$3\frac{1}{2}+2\frac{1}{3}$
$6\frac{5}{6}-1\frac{1}{2}$
$4\div 1\frac{1}{2}$
$6\frac{1}{2}\div 1\frac{1}{2}$
$8\frac{2}{3}\times 4$
$15\frac{7}{8}-12\frac{1}{2}$
$18-7\frac{3}{8}$

12.

$1\frac{2}{3}\div\frac{1}{2}$
$3\frac{1}{3}\times 5$
$14\frac{3}{8}+12\frac{1}{2}$
$11\frac{1}{3}-8\frac{1}{2}$
$4\frac{1}{2}\div 2\frac{1}{2}$
$16\frac{1}{3}\times 8$
$4\frac{5}{6}\times 10$
$15\frac{1}{6}-12\frac{2}{3}$

13.

$16-1\frac{1}{6}$
$27\frac{1}{2}-3\frac{2}{3}$
$8\times 7\frac{1}{6}$
$3\frac{2}{3}\times 10$
$14\frac{5}{6}+4\frac{1}{2}$
$21\frac{3}{4}-14\frac{7}{8}$
$3\frac{7}{8}\times 14$
$14\frac{1}{4}-3\frac{1}{2}$

14:

$\frac{2}{3}$ of $2\frac{1}{2}$
$\frac{3}{4}$ of $3\frac{1}{2}$
$\frac{5}{6}$ of 15
$\frac{1}{2}\times 3\frac{2}{3}$
$6\div\frac{3}{4}$
$6\div\frac{2}{3}$
$8\div\frac{5}{6}$
$3\frac{1}{2}\div 2\frac{1}{3}$

15.

$6\frac{1}{6}\div\frac{1}{6}$
$3\frac{2}{3}\div\frac{1}{6}$
$8\frac{2}{3}\div\frac{5}{6}$
$4\frac{1}{3}\div 1\frac{5}{6}$
$6\frac{1}{2}\div 3\frac{2}{3}$
$3\frac{1}{2}\times 14$
$18\times 3\frac{3}{4}$
$16\times 2\frac{1}{3}$

1. If a man walks $2\frac{3}{4}$ miles an hour, how far will he walk in 2 hours? in 6 hours?

2. At $6\frac{1}{4}$ dollars a cord, what will $\frac{1}{3}$ of a cord of wood cost? $\frac{2}{3}$ of a cord?

3. At $\$\frac{1}{2}$ a yard, how many yards of cloth can I buy for $\$8\frac{1}{2}$? for $\$14\frac{1}{2}$?

4. At $\$\frac{2}{3}$ a yard, how many yards of cloth can I buy for $12? for $\$6\frac{2}{3}$? for $\$9\frac{1}{3}$?

5. At $\$\frac{3}{4}$ a bushel, how many bushels of corn can I buy for $\$7\frac{1}{4}$? for $\$4\frac{1}{2}$? for $9?

6. How many quarts of berries are picked by 6 boys if each boy picks $3\frac{5}{6}$ quarts?

7. William is $3\frac{7}{12}$ years older than John, and John is $4\frac{2}{3}$ years older than James who is $12\frac{3}{4}$ years old. How old is John? How old is William?

8. Josephine studies every day $\frac{7}{12}$ of an hour, and practices $\frac{5}{6}$ of an hour. How many hours does she study and practice in a week?

9. $\frac{2}{3}$ of the days in June are how many days?

10. $\frac{1}{6}$ of the days in July is how many days and hours?

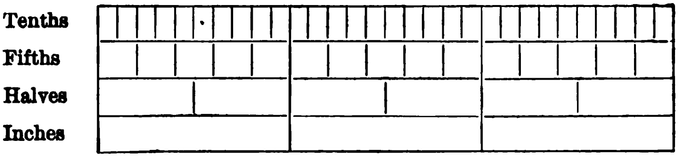
11. I bought at one time $5\frac{7}{8}$ lb. of meat, and at another time $4\frac{3}{4}$ lb. What did it all cost at 10¢ a pound?

12. What will $\frac{5}{9}$ of a pound of tea cost at 70¢ a pound?

13. From a board $8\frac{3}{4}$ ft. long a piece $3\frac{1}{12}$ ft. long was sawed. What was the length of the remaining part?

14. A man had $16\frac{1}{4}$ dollars. He spent $3\frac{3}{8}$ dollars at one time and $4\frac{1}{2}$ dollars at another time. How much money had he left?

15. $2\frac{1}{3}$ yd. + $3\frac{5}{9}$ yd. + $\frac{5}{6}$ yd. are how many feet?



1. How many tenths in 1 in.? in $\frac{1}{5}$ in.? in $\frac{2}{5}$ in.?

2. How many fifths in $1\frac{1}{5}$ in.? in $\frac{2}{10}$ in.? in $\frac{8}{10}$ in.?

3. $\frac{2}{5}$ in. + $\frac{4}{5}$ in. = ? $\frac{1}{5}$ in. + $\frac{1}{10}$ in. = ? $\frac{1}{10}$ in. + $\frac{3}{5}$ in. = ?

4. $\frac{1}{2}$ in. + $\frac{1}{10}$ in. = ? $\frac{1}{2}$ in. + $\frac{7}{10}$ in. = ? $1\frac{1}{2}$ in. + $\frac{9}{10}$ in. = ?

5. $\frac{1}{5}$ in. − $\frac{1}{10}$ in. = ? $\frac{3}{5}$ in. − $\frac{1}{10}$ in. = ? $\frac{4}{10}$ in. − $\frac{1}{5}$ in. = ?

6. $\frac{7}{10}$ in. − $\frac{2}{5}$ in. = ? $\frac{9}{10}$ in. − $\frac{3}{5}$ in. = ? $\frac{4}{5}$ in. − $\frac{7}{10}$ in = ?

7. $\frac{1}{2}$ in. − $\frac{1}{10}$ in. = ? $\frac{6}{10}$ in. − $\frac{1}{2}$ in. = ? $1\frac{1}{2}$ in. − $\frac{6}{10}$ in. = ?

8. $\frac{2}{10}$ in. × 2 = ? $\frac{3}{5}$ in. × 2 = ? $\frac{8}{10}$ in. × 2 = ?

9. $\frac{6}{10}$ in. × 2 = ? $\frac{2}{5}$ in. × 3 = ? $\frac{6}{10}$ in. × 3 = ?

10. $\frac{4}{5}$ in. × 3 = ? $\frac{7}{10}$ × 3 = ? $\frac{8}{10}$ × 5 = ?

11. 2 in. contains $\frac{1}{5}$ in. how many times? 2 ÷ $\frac{1}{5}$ = ?

12. $1\frac{1}{5}$ in. contains $\frac{1}{10}$ in. how many times? $1\frac{1}{5} \div \frac{1}{10}$ = ?

13. $2\frac{4}{5}$ in. contains $\frac{2}{10}$ in. how many times? $2\frac{4}{5} \div \frac{2}{10}$ = ?

14. $\frac{1}{2}$ of $\frac{2}{5}$ in. = ? $\frac{1}{5}$ of $\frac{1}{2}$ in. = ? $\frac{3}{5}$ of $\frac{1}{2}$ in. = ?

15. $\frac{1}{5}$ of $1\frac{1}{2}$ in. = ? $\frac{2}{5}$ of 2 in. = ? $\frac{1}{2}$ of $\frac{3}{5}$ in. = ?

16.

$\frac{4}{5} + \frac{1}{5}$
$1 - \frac{3}{5}$
$\frac{4}{5} + \frac{2}{5}$
$1\frac{1}{5} - \frac{3}{5}$
$2\frac{3}{5} + \frac{4}{5}$
$2\frac{2}{5} - \frac{3}{5}$
$3\frac{4}{5} + \frac{4}{5}$
$3\frac{1}{5} - \frac{4}{5}$

17.

$\frac{1}{5} \times 2$
$\frac{1}{5} \times 4$
$\frac{2}{5} \times 2$
$\frac{2}{5} \times 4$
$\frac{3}{5} \times 2$
$\frac{4}{5} \times 3$
$1\frac{1}{5} \times 5$
$1\frac{1}{5} \times 6$

18.

$\frac{1}{2}$ of $\frac{2}{5}$
$\frac{2}{5} \div 2$
$\frac{4}{5} \div 2$
$\frac{4}{5} \div 4$
$1\frac{3}{5} \div 2$
$2\frac{2}{5} \div 3$
$2\frac{4}{5} \div 2$
$\frac{4}{5} \div \frac{1}{5}$

19.

$\frac{1}{5}$ of 2
$\frac{1}{5}$ of 4
$\frac{2}{5}$ of 80
$\frac{3}{5}$ of 15
$\frac{4}{5}$ of 12
$12 \times 1\frac{3}{5}$
$18 \times \frac{2}{5}$
$6\frac{2}{5} \div \frac{2}{5}$

20.

$8\frac{3}{5} + 4\frac{4}{5}$
$20 - 6\frac{1}{5}$
$6\frac{1}{5} \times 3$
$4 \times 2\frac{4}{5}$
$8 \div \frac{2}{5}$
$6\frac{1}{5} \times 8$
$17\frac{1}{5} - 4\frac{3}{5}$
$9\frac{2}{5} + 8\frac{4}{5}$

1.

$4 \div \frac{1}{3}$
$4 \div \frac{2}{3}$
$8 \div \frac{2}{3}$
$12 \div \frac{1}{4}$
$12 \div \frac{3}{4}$
$3 \div \frac{1}{8}$
$3 \div \frac{3}{8}$
$9 \div \frac{3}{4}$
$12 \div \frac{2}{3}$

2.

$8 \div \frac{2}{12}$
$9 \div \frac{9}{12}$
$10 \div \frac{5}{12}$
$10 \div \frac{5}{8}$
$21 \div \frac{3}{8}$
$1 \div \frac{1}{4}$
$\frac{1}{2} \div \frac{1}{4}$
$1\frac{1}{2} \div \frac{1}{4}$
$\frac{1}{3} \div \frac{1}{2}$

3.

$1\frac{1}{2} \div \frac{1}{4}$
$1\frac{1}{2} \div \frac{3}{4}$
$4\frac{1}{3} \div \frac{1}{2}$
$4\frac{1}{2} \div \frac{1}{3}$
$4\frac{1}{2} \div \frac{2}{3}$
$3\frac{2}{3} \div \frac{1}{3}$
$3\frac{2}{3} \div \frac{2}{3}$
$1\frac{1}{6} \div \frac{1}{2}$
$1\frac{1}{2} \div \frac{2}{6}$

4.

$5\frac{1}{2} + 2\frac{3}{5}$
$16\frac{1}{3} + 4\frac{1}{2}$
$18\frac{1}{9} - 6\frac{2}{3}$
$12 \div \frac{3}{5}$
$16\frac{1}{4} - 3\frac{2}{3}$
$16\frac{1}{2} \times 8$
$3\frac{1}{3} \times 15$
$\frac{3}{4}$ of $18\frac{1}{2}$
$\frac{3}{8}$ of 31

5.

$8\frac{1}{2} + 4\frac{7}{10}$
$3\frac{3}{4} \times 16$
$14\frac{1}{2} \times 3\frac{1}{3}$
$4\frac{3}{8} \times 21$
$8\frac{7}{8} - 6\frac{3}{4}$
$15 \div \frac{5}{6}$
$\frac{3}{4}$ of $15\frac{1}{2}$
$\frac{7}{8}$ of 43
$12\frac{2}{3} \div \frac{3}{4}$

6.

$10\frac{1}{2} - 4\frac{5}{6}$
$2\frac{3}{4} \div 1\frac{1}{2}$
$17\frac{1}{2} \times 8$
$12\frac{2}{3} - 8\frac{3}{4}$
$\frac{3}{8}$ of 50
$16 \div \frac{3}{10}$
$8\frac{2}{3} \times 12$
$15\frac{1}{2} + 12\frac{7}{12}$
$12\frac{4}{5} \times 8$

7.

$12\frac{3}{7} \times 6$
$4 \times 7\frac{3}{11}$
$14 - 6\frac{10}{11}$
$\frac{7}{10} \times 21$
$14\frac{4}{5} + 12\frac{1}{2}$
$\frac{3}{5}$ of $16\frac{1}{2}$
$14\frac{2}{3} + 18\frac{5}{6}$
$15\frac{1}{8} - 4\frac{3}{4}$
$16\frac{5}{12} - 13\frac{2}{3}$

8.

$38\frac{7}{12} - 16\frac{1}{3}$
$25 \div \frac{2}{3}$
$16\frac{1}{2} \times 4$
$34\frac{4}{5} + 16\frac{1}{2}$
$100 - 64\frac{2}{3}$
$27\frac{1}{2} \times 3$
$50 \times 2\frac{1}{2}$
$17\frac{5}{6} \div 3$
$15\frac{5}{9} + 6\frac{2}{3}$

9.

$1 \div 10$
$\frac{1}{5} \div 2$
$\frac{1}{10} + \frac{1}{10}$
$\frac{3}{10} + \frac{6}{10}$
$1 - \frac{7}{10}$
$\frac{8}{10} - \frac{2}{10}$
$\frac{9}{10} + \frac{3}{10}$
$1\frac{1}{10} - \frac{6}{10}$

10.

$\frac{1}{10} \times 2$
$\frac{8}{10} \div 2$
$\frac{8}{10} \div 4$
$1 \div \frac{1}{10}$
$2\frac{1}{2} + 8\frac{3}{5}$
$6\frac{1}{5} - 4\frac{1}{2}$
$\frac{1}{2}$ of $18\frac{1}{5}$
$\frac{3}{5}$ of $12\frac{1}{2}$

11.

$8\frac{3}{10} \div \frac{1}{10}$
$4\frac{4}{5} \div \frac{2}{5}$
$6\frac{7}{10} \div \frac{3}{5}$
$4\frac{1}{2} \div \frac{4}{5}$
$7\frac{1}{2} \times \frac{3}{5}$
$18\frac{2}{5} \times 2$
$11\frac{1}{10} - 6\frac{4}{5}$
$8\frac{1}{5} \div \frac{1}{2}$

12.

$8\frac{4}{5} + 6\frac{1}{2}$
$5\frac{1}{10} \div \frac{4}{5}$
$8\frac{3}{5} - 7\frac{9}{10}$
$\frac{4}{5}$ of $12\frac{1}{2}$
$\frac{7}{10}$ of 16
$8\frac{1}{2} \div \frac{1}{10}$
$3\frac{2}{5} \times 16$
$18 \times 4\frac{3}{10}$

13.

$15\frac{1}{5} - 3\frac{6}{10}$
$15 \times 8\frac{3}{5}$
$16\frac{3}{10} \times 8$
$4\frac{4}{5} \times 21$
$10\frac{1}{10} \div \frac{1}{2}$
$18\frac{1}{10} - 16\frac{1}{2}$
$12\frac{2}{5} \div \frac{3}{10}$
$17\frac{4}{5} \times 9$

	A	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*I*	*J*	*K*	*L*
1.	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{7}{8}$	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{2}{4}$	$\frac{18}{4}$	2	$1\frac{1}{2}$	$\frac{7}{8}$	16
2.	$\frac{3}{4}$	$\frac{1}{4}$	$\frac{1}{3}$	$\frac{2}{3}$	$\frac{2}{6}$	$\frac{1}{4}$	$\frac{3}{6}$	$\frac{14}{4}$	4	$3\frac{2}{3}$	$1\frac{1}{2}$	13
3.	$\frac{4}{8}$	$\frac{2}{8}$	$\frac{1}{4}$	$\frac{3}{2}$	$\frac{3}{4}$	$\frac{3}{8}$	$\frac{2}{8}$	$\frac{16}{8}$	3	$2\frac{1}{4}$	$1\frac{3}{8}$	19
4.	$\frac{7}{9}$	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{4}{3}$	$\frac{1}{3}$	$\frac{4}{9}$	$\frac{6}{9}$	$\frac{15}{9}$	8	$5\frac{3}{9}$	$2\frac{2}{3}$	17
5.	$\frac{7}{6}$	$\frac{9}{12}$	$\frac{1}{2}$	$\frac{5}{6}$	$\frac{2}{3}$	$\frac{5}{12}$	$\frac{10}{12}$	$\frac{18}{12}$	6	$4\frac{11}{12}$	$3\frac{3}{4}$	14
6.	$\frac{2}{3}$	$\frac{1}{3}$	$\frac{1}{3}$	$\frac{5}{3}$	$\frac{1}{3}$	$\frac{2}{9}$	$\frac{6}{9}$	$\frac{16}{9}$	5	$8\frac{2}{3}$	$4\frac{4}{9}$	15
7.	$\frac{5}{6}$	$\frac{2}{3}$	$\frac{1}{3}$	$\frac{3}{4}$	$\frac{1}{6}$	$\frac{5}{12}$	$\frac{3}{9}$	$\frac{32}{6}$	9	$6\frac{5}{6}$	$3\frac{1}{3}$	21
8.	$\frac{11}{12}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{5}{6}$	$\frac{2}{3}$	$\frac{3}{4}$	$\frac{10}{12}$	$\frac{44}{12}$	12	$3\frac{3}{12}$	$1\frac{3}{4}$	20
9.	$\frac{9}{10}$	$\frac{4}{5}$	$\frac{1}{2}$	$\frac{4}{5}$	$\frac{1}{2}$	$\frac{3}{10}$	$\frac{6}{10}$	$\frac{88}{10}$	7	$2\frac{4}{5}$	$1\frac{1}{2}$	26
10.	$\frac{11}{12}$	$\frac{5}{6}$	$\frac{2}{3}$	$\frac{5}{6}$	$\frac{1}{2}$	$\frac{1}{3}$	$\frac{8}{12}$	$\frac{44}{12}$	8	$5\frac{7}{12}$	$2\frac{2}{6}$	30

1. Reduce G to lowest terms.

2. Reduce H to whole or mixed numbers.

3. $A+B$ $B+F$ $A-B$ $I-F$ $A\times I$ $I\div C$

4. $A+C$ $B+J$ $A-C$ $J-A$ $B\times I$ $I\div B$

5. $A+D$ $B+K$ $D-E$ $J-B$ $C\times I$ $I\div A$

6. $A+E$ $D+C$ $D-F$ $J-C$ $D\times I$ $I\div E$

7. $A+J$ $D+E$ $H-A$ $J-D$ $E\times I$ $I\div D$

8. $A+K$ $D+E$ $H-B$ $J-E$ $C\times L$ $L\div C$

9. $B+C$ $D+F$ $H-G$ $K-A$ $D\times L$ $L\div B$

10. $B+D$ $D+J$ $I-D$ $K-D$ $F\times L$ $L\div A$

11. $B+E$ $D+K$ $I-E$ $K-G$ $G\times L$ $L\div G$

12. Reduce to ounces B lb.; C; A; F; G; J; K.

13. Reduce to inches B ft.; C; A; D; G; J; K.

14. What will A lb. of meat cost at L¢ a pound?

15. At I¢ an ounce, what will J oz. of — cost?

Oral and Written Exercises.

1. How many cents in $\$\frac{1}{2}$? $\$\frac{1}{4}$? $\$\frac{3}{4}$? $\$\frac{1}{8}$? $\$\frac{3}{8}$? $\$\frac{5}{8}$?

2. How many cents in $\$\frac{1}{3}$? $\$\frac{2}{3}$? $\$\frac{1}{6}$? $\$\frac{5}{6}$? $\$\frac{1}{12}$? $\$\frac{5}{12}$? $\$\frac{7}{12}$? $\$\frac{11}{12}$?

3. How many cents in $\$\frac{1}{5}$? $\$\frac{2}{5}$? $\$\frac{3}{5}$? $\$\frac{4}{5}$? $\$\frac{3}{10}$? $\$\frac{7}{10}$? $\$\frac{9}{10}$?

4. How many cents in $\$\frac{1}{7}$? $\$\frac{2}{7}$? $\$\frac{3}{7}$? $\$\frac{4}{7}$? $\$\frac{5}{7}$? $\$\frac{6}{7}$?

6. How many cents in $\$\frac{1}{11}$? $\$\frac{2}{11}$? $\$\frac{3}{11}$? $\$\frac{4}{11}$? $\$\frac{5}{11}$? $\$\frac{6}{11}$? $\$\frac{7}{11}$? $\$\frac{8}{11}$?

6. Tell at sight the fraction of a dollar each of the following is: $12\frac{1}{2}$¢? $37\frac{1}{2}$¢? 25¢? 75¢? $16\frac{2}{3}$¢? $33\frac{1}{3}$¢? $62\frac{1}{2}$¢? $66\frac{2}{3}$¢? $87\frac{1}{2}$¢? $8\frac{1}{3}$¢? $83\frac{1}{3}$¢?

7. At $12\frac{1}{2}$¢ a yd., what will 7 yd. of cloth cost?

8. At $37\frac{1}{2}$¢ a gal., what will 18 gal. of molasses cost?

9. At $8\frac{1}{3}$¢ a lb., what will 120 lb. of cheese cost?

10. At $16\frac{2}{3}$¢ a doz., what will 66 eggs cost?

11. At $87\frac{1}{2}$¢ a bu., what will 20 bu. of wheat cost?

12. At $\$2.33\frac{1}{3}$ a bbl., what will 30 bbl. of apples cost?

13. Show by lines or circles that:

$\frac{2}{3}$ of $1=\frac{1}{3}$ of 2; $\frac{3}{4}$ of $1=\frac{1}{4}$ of 3; $\frac{5}{6}$ of $1=\frac{1}{6}$ of 5.

14. Divide $\frac{2}{3}$ of a pound of candy equally among 4 boys. (Show by lines.) $\frac{1}{4}$ of $\frac{2}{3}$ = ?

15. How many pounds of tea at $\$\frac{2}{3}$ a pound can be bought for \$4? (Show by drawings.)

16. If I divide $1\frac{3}{4}$ lb. of tea equally among 3 families, how much will each family receive? (Show by lines or circles.) $\frac{1}{3}$ of $1\frac{3}{4}$ = ?

17. What will 8 yards of cloth cost at $\$\frac{2}{3}$ a yard?

1. At $\$\frac{3}{8}$ a peck, what will 2 bu. of potatoes cost?

2. At $\$\frac{1}{12}$ a quart, what will 2 pecks of cranberries cost? $\frac{3}{4}$ of a bushel?

3. What must I pay for a dozen peaches at the rate of $\frac{2}{3}$ of a cent apiece?

4. At the rate of 3 apples for 5 cents, what do I pay apiece?

5. From a piece of cloth $30\frac{1}{2}$ yd. long there were sold at one time $8\frac{3}{4}$ yd., and at another time $14\frac{1}{2}$ yd. What is the remainder worth at $8\frac{1}{2}$¢ a yard?

6. A workman being paid at the rate of $\$1\frac{3}{4}$ a day would receive what in the month of April, counting 4 Sundays in the month?

7. If 1 yd. of cloth costs $\frac{3}{8}$ of a dollar, how many yards can I buy for \$6? for $\$2\frac{1}{4}$? for $\$7\frac{1}{2}$?

8. At $\$\frac{3}{4}$ a yd., how many yards of cloth can be bought for \$3? for $\$7\frac{1}{2}$? for $\$3\frac{3}{4}$?

9. If a man smokes 4 cigars a day, and the cigars cost at the rate of three for ten cents, what will his cigars cost him a week? a month? a year?

10. How many yards of ribbon in three pieces containing $4\frac{1}{3}$ yd., $3\frac{3}{4}$ yd., and $4\frac{1}{2}$ yd.?

11. John had 20 cents and James had $\frac{4}{5}$ as much; James's money was $\frac{1}{2}$ of William's. How much had William?

12. From a dollar there was paid the cost of $2\frac{1}{2}$ lb. of raisins at 14¢ a pound, and $3\frac{1}{4}$ lb. of fish at 8¢ a pound. How much money was left?

13. $\frac{3}{4}$ of the days in September are how many days and hours?

Add :

1.	**2.**	**3.**	**4.**	**5.**	**6.**	**7.**
$1\frac{3}{4}$	$3\frac{1}{3}$	$5\frac{4}{5}$	$2\frac{1}{4}$	$6\frac{2}{3}$	$4\frac{1}{2}$	$5\frac{3}{8}$
$2\frac{1}{2}$	$6\frac{3}{4}$	$2\frac{3}{10}$	$3\frac{3}{8}$	$2\frac{7}{9}$	$6\frac{6}{8}$	$8\frac{3}{4}$
$3\frac{3}{8}$	$4\frac{1}{2}$	$4\frac{1}{2}$	$1\frac{1}{2}$	$4\frac{1}{3}$	$5\frac{2}{4}$	$9\frac{1}{2}$
$2\frac{1}{4}$	$2\frac{5}{6}$	$3\frac{1}{5}$	$7\frac{3}{4}$	$5\frac{4}{9}$	$8\frac{4}{6}$	$7\frac{3}{4}$
$1\frac{5}{8}$	$6\frac{1}{2}$	$2\frac{7}{10}$	$6\frac{7}{8}$	$2\frac{2}{3}$	$9\frac{4}{8}$	$3\frac{7}{8}$

8.	**9.**	**10.**	**11.**	**12.**	**13.**
$8\frac{7}{8}$	$5\frac{1}{4}$	$8\frac{5}{9}$	$14\frac{6}{9}$	$36\frac{7}{10}$	$84\frac{3}{9}$
$3\frac{3}{4}$	$8\frac{2}{3}$	$9\frac{1}{3}$	$28\frac{4}{8}$	$45\frac{6}{12}$	$75\frac{1}{2}$
$5\frac{1}{2}$	$9\frac{5}{6}$	$13\frac{1}{9}$	$16\frac{4}{12}$	$74\frac{4}{8}$	$86\frac{3}{4}$
$6\frac{5}{8}$	$12\frac{5}{12}$	$18\frac{2}{3}$	$17\frac{2}{3}$	$28\frac{8}{10}$	$94\frac{6}{8}$
$7\frac{1}{4}$	$6\frac{3}{4}$	$6\frac{7}{9}$	$26\frac{1}{6}$	$63\frac{4}{5}$	$37\frac{5}{12}$

14.	**15.**	**16.**	**17.**	**18.**	**19.**
$27\frac{1}{3}$	$28\frac{1}{4}$	$67\frac{7}{12}$	$59\frac{1}{2}$	$68\frac{7}{8}$	$27\frac{5}{6}$
$83\frac{7}{9}$	$416\frac{3}{18}$	$38\frac{3}{4}$	$27\frac{4}{5}$	$47\frac{3}{4}$	$84\frac{3}{12}$
$46\frac{2}{3}$	$39\frac{1}{2}$	$56\frac{1}{2}$	$68\frac{3}{10}$	$89\frac{1}{8}$	$74\frac{5}{12}$
$83\frac{5}{9}$	$68\frac{3}{4}$	$83\frac{2}{3}$	$97\frac{3}{5}$	$74\frac{1}{2}$	$88\frac{3}{4}$
$67\frac{8}{9}$	$57\frac{7}{8}$	$26\frac{1}{4}$	$28\frac{1}{2}$	$96\frac{5}{8}$	$73\frac{1}{2}$

20.	**21.**	**22.**	**23.**	**24.**	**25.**
$84\frac{4}{6}$	$87\frac{1}{2}$	$37\frac{1}{6}$	$47\frac{3}{8}$	$37\frac{10}{12}$	$93\frac{2}{3}$
$42\frac{2}{3}$	$58\frac{3}{4}$	$66\frac{7}{12}$	$29\frac{3}{4}$	$69\frac{4}{6}$	$49\frac{5}{6}$
$67\frac{1}{9}$	$74\frac{2}{8}$	$48\frac{5}{6}$	$56\frac{4}{8}$	$45\frac{1}{2}$	$82\frac{11}{12}$
$58\frac{7}{9}$	$99\frac{7}{8}$	$75\frac{1}{2}$	$38\frac{1}{2}$	$88\frac{7}{12}$	$68\frac{1}{2}$
$94\frac{1}{3}$	$66\frac{3}{4}$	$59\frac{11}{12}$	$64\frac{1}{4}$	$54\frac{4}{8}$	$71\frac{3}{4}$
$63\frac{5}{9}$	$83\frac{1}{2}$	$84\frac{3}{4}$	$85\frac{7}{8}$	$76\frac{9}{12}$	$57\frac{7}{12}$

Find the difference :

1.	**2.**	**3.**	**4.**	**5.**	**6.**	**7.**
$10\frac{3}{4}$	$8\frac{7}{8}$	$4\frac{1}{3}$	$8\frac{3}{4}$	9	12	18
$4\frac{1}{4}$	$3\frac{5}{8}$	$1\frac{2}{3}$	$4\frac{1}{4}$	$4\frac{3}{4}$	$7\frac{7}{12}$	$9\frac{7}{8}$
8.	**9.**	**10.**	**11.**	**12.**	**13.**	**14.**
$12\frac{3}{4}$	$8\frac{2}{3}$	$10\frac{5}{8}$	$14\frac{1}{4}$	$16\frac{1}{3}$	$15\frac{3}{8}$	$16\frac{5}{12}$
$7\frac{1}{2}$	$3\frac{1}{6}$	$4\frac{1}{4}$	$8\frac{1}{2}$	$8\frac{5}{6}$	$6\frac{3}{4}$	$9\frac{2}{3}$
15.	**16.**	**17.**	**18.**	**19.**	**20.**	**21.**
$24\frac{1}{2}$	$26\frac{1}{8}$	$38\frac{1}{2}$	$30\frac{3}{12}$	$46\frac{3}{4}$	$31\frac{5}{8}$	40
$10\frac{7}{10}$	$18\frac{3}{4}$	$27\frac{4}{5}$	$10\frac{7}{8}$	$18\frac{5}{6}$	$21\frac{3}{4}$	$26\frac{7}{12}$
22.	**23.**	**24.**	**25.**	**26.**	**27.**	**28.**
$28\frac{3}{4}$	$58\frac{1}{6}$	$73\frac{1}{2}$	$60\frac{1}{2}$	$72\frac{1}{6}$	$74\frac{4}{5}$	$81\frac{6}{9}$
$27\frac{7}{8}$	$49\frac{2}{3}$	$27\frac{9}{10}$	$58\frac{4}{5}$	$38\frac{5}{12}$	$65\frac{3}{10}$	$19\frac{4}{8}$
29.	**30.**	**31.**	**32.**	**33.**	**34.**	**35.**
40	83	$46\frac{6}{10}$	$75\frac{4}{6}$	$62\frac{1}{4}$	$48\frac{6}{12}$	$63\frac{1}{3}$
$27\frac{7}{11}$	$27\frac{4}{7}$	$38\frac{1}{2}$	$25\frac{4}{9}$	$37\frac{7}{8}$	$27\frac{3}{8}$	$18\frac{5}{9}$

36.	**37.**	**38.**	**39.**	**40.**	**41.**
100	100	135	$286\frac{2}{3}$	$371\frac{3}{8}$	$289\frac{9}{12}$
$48\frac{3}{8}$	$71\frac{4}{9}$	$68\frac{5}{7}$	$127\frac{1}{9}$	$284\frac{3}{4}$	$148\frac{6}{9}$
42.	**43.**	**44.**	**45.**	**46.**	**47.**
$384\frac{4}{9}$	$806\frac{1}{10}$	$704\frac{3}{8}$	$380\frac{1}{4}$	$628\frac{2}{9}$	$582\frac{6}{7}$
$160\frac{2}{3}$	$272\frac{4}{5}$	$196\frac{3}{4}$	$159\frac{5}{8}$	$439\frac{7}{9}$	$296\frac{3}{7}$
48.	**49.**	**50.**	**51.**	**52.**	**53.**
$642\frac{1}{12}$	$700\frac{1}{4}$	$608\frac{2}{3}$	$250\frac{1}{10}$	$812\frac{1}{3}$	$960\frac{1}{5}$
$264\frac{1}{2}$	$380\frac{5}{12}$	$219\frac{7}{12}$	$86\frac{1}{2}$	$458\frac{7}{9}$	$307\frac{9}{10}$

Reduce to whole or mixed numbers:

1. $\frac{18}{4}$; $\frac{38}{9}$; $\frac{32}{8}$; $\frac{76}{6}$; $\frac{93}{12}$; $\frac{47}{2}$; $\frac{85}{10}$.
2. $\frac{190}{4}$; $\frac{186}{8}$; $\frac{274}{9}$; $\frac{384}{7}$; $\frac{562}{12}$; $\frac{846}{11}$.

Reduce to fractional numbers (first to lowest terms):

3. $2\frac{1}{2}$; $3\frac{3}{4}$; $4\frac{2}{5}$; $6\frac{3}{10}$; $4\frac{7}{9}$; $8\frac{3}{7}$; $2\frac{10}{11}$.
4. $8\frac{5}{12}$; $9\frac{6}{12}$; $8\frac{4}{12}$; $7\frac{6}{9}$; $8\frac{5}{7}$; $7\frac{10}{12}$; $9\frac{9}{12}$.
5. $15\frac{2}{3}$; $18\frac{1}{2}$; $24\frac{1}{4}$; $27\frac{3}{4}$; $32\frac{6}{8}$; $65\frac{8}{9}$; $72\frac{3}{8}$.
6. $42\frac{5}{6}$; $36\frac{3}{4}$; $32\frac{8}{9}$; $59\frac{6}{7}$; $67\frac{10}{11}$; $84\frac{11}{12}$; $92\frac{4}{8}$.

Multiply:

7.	**8.**	**9.**	**10.**	**11.**	**12.**	**13.**
$2\frac{1}{2}$	$8\frac{1}{3}$	$9\frac{1}{2}$	$4\frac{3}{12}$	$4\frac{2}{5}$	$7\frac{3}{12}$	$8\frac{3}{10}$
6	4	2	8	8	8	6
14.	**15.**	**16.**	**17.**	**18.**	**19.**	**20.**
7	8	5	9	10	12	11
$3\frac{1}{2}$	$4\frac{1}{3}$	$8\frac{2}{3}$	$6\frac{3}{4}$	$4\frac{4}{5}$	$6\frac{3}{8}$	$4\frac{4}{7}$
21.	**22.**	**23.**	**24.**	**25.**	**26.**	**27.**
$15\frac{1}{3}$	$18\frac{1}{2}$	$27\frac{1}{4}$	$34\frac{2}{3}$	$28\frac{4}{9}$	$38\frac{4}{10}$	$43\frac{8}{9}$
6	8	6	8	7	9	6
28.	**29.**	**30.**	**31.**	**32.**	**33.**	**34.**
$3\frac{1}{2}$	$4\frac{1}{3}$	$5\frac{1}{6}$	$3\frac{1}{4}$	$5\frac{1}{8}$	$2\frac{5}{6}$	$4\frac{3}{4}$
$2\frac{1}{2}$	$3\frac{1}{2}$	$1\frac{1}{2}$	$2\frac{1}{2}$	8	$3\frac{1}{2}$	$5\frac{1}{3}$

35.	**36.**	**37.**	**38.**	**39.**	**40.**
$21\frac{1}{2}$	$32\frac{1}{4}$	$84\frac{1}{3}$	$28\frac{2}{3}$	$36\frac{3}{4}$	$29\frac{5}{6}$
$3\frac{1}{2}$	$6\frac{1}{2}$	$5\frac{1}{2}$	$8\frac{1}{2}$	$7\frac{1}{2}$	$9\frac{1}{2}$

Multiply:

1.	**2.**	**3.**	**4.**	**5.**	**6.**
$86\frac{1}{2}$	$83\frac{1}{4}$	$78\frac{2}{3}$	$58\frac{3}{4}$	$48\frac{5}{6}$	$56\frac{1}{2}$
$\underline{12\frac{1}{2}}$	$\underline{23\frac{1}{2}}$	$\underline{18\frac{1}{2}}$	$\underline{27\frac{1}{2}}$	$\underline{32\frac{1}{2}}$	$\underline{24\frac{3}{4}}$

7.	**8.**	**9.**	**10.**	**11.**	**12.**
$91\frac{3}{4}$	$85\frac{1}{6}$	$34\frac{1}{3}$	$78\frac{5}{6}$	$91\frac{9}{10}$	85
$\underline{27\frac{1}{2}}$	$\underline{22\frac{1}{2}}$	$\underline{65\frac{2}{3}}$	$\underline{36\frac{1}{2}}$	$\underline{26}$	$\underline{72\frac{11}{12}}$

13. Reduce to thirds: 4; $8\frac{1}{3}$; 24; $28\frac{2}{3}$; $140\frac{1}{3}$.
14. Reduce to fourths: 6; $7\frac{3}{4}$; $37\frac{1}{4}$; 140; $280\frac{1}{4}$.

Divide:

15.	**16.**	**17.**	**18.**	**19.**	**20.**
$4)\underline{8\frac{1}{2}}$	$3)\underline{6\frac{1}{2}}$	$2)\underline{8\frac{1}{3}}$	$3)\underline{16\frac{1}{4}}$	$4)\underline{27\frac{1}{3}}$	$6)\underline{35\frac{1}{2}}$

21.	**22.**	**23.**	**24.**	**25.**
$1\frac{1}{2})\underline{17}$	$1\frac{1}{3})\underline{18}$	$2\frac{1}{2})\underline{26}$	$3\frac{1}{2})\underline{42}$	$2\frac{2}{3})\underline{48}$

26.	**27.**	**28.**	**29.**
$4)\underline{86\frac{1}{2}}$	$3)\underline{124\frac{1}{4}}$	$6)\underline{483\frac{1}{2}}$	$2)\underline{384\frac{5}{6}}$

30.	**31.**	**32.**	**33.**
$1\frac{1}{2})\underline{342}$	$1\frac{1}{3})\underline{462}$	$2\frac{1}{2})\underline{849}$	$3\frac{1}{2})\underline{620}$

34.	**35.**	**36.**	**37.**
$2\frac{2}{3})\underline{586}$	$3\frac{1}{3})\underline{486}$	$2\frac{3}{4})\underline{683}$	$5\frac{1}{2})\underline{437}$

38. Divide $12\frac{1}{2}$ by $\frac{1}{2}$; by $1\frac{1}{2}$; by $\frac{1}{4}$; by $2\frac{1}{4}$.
39. Divide $8\frac{2}{3}$ by $1\frac{1}{2}$; by $2\frac{1}{3}$; by $3\frac{1}{3}$; by $2\frac{3}{4}$.
40. Reduce to eighths: $\frac{1}{2}$; $\frac{8}{4}$; $2\frac{3}{4}$; $5\frac{1}{2}$; $6\frac{7}{8}$.
41. Reduce to twelfths: $\frac{3}{4}$; $3\frac{1}{3}$; $6\frac{1}{4}$; $8\frac{1}{2}$; $7\frac{5}{6}$; $28\frac{3}{4}$.

1. Reduce to twelfths: 50; $62\frac{1}{2}$; $37\frac{3}{4}$; $82\frac{5}{6}$.

2. Divide 40 by $8\frac{3}{4}$; by $14\frac{2}{3}$; by $16\frac{5}{6}$.

3. Divide $20\frac{2}{3}$ by $1\frac{1}{2}$; by $6\frac{3}{4}$; by $12\frac{5}{6}$.

4. Divide $80\frac{3}{4}$ by $7\frac{1}{2}$; by $18\frac{2}{3}$; by $24\frac{1}{6}$.

5. $(16\frac{3}{4} + 27\frac{2}{3} - 14\frac{1}{2} + 16\frac{1}{6}) \times 20$.

6. $(18\frac{1}{2} \times 1\frac{1}{2} + 12\frac{1}{4} - 16\frac{2}{3} + 25\frac{1}{2}) \div 3\frac{1}{3}$.

7. $(24\frac{2}{3} - 15\frac{1}{2} + 25\frac{3}{4} - 27\frac{1}{3} + 4\frac{7}{12}) \times 12$.

8. $(37\frac{1}{8} - 13\frac{1}{2} - 18\frac{3}{4} + 28\frac{7}{8}) \times 12$.

9. $(140 \div 2\frac{2}{5} + 16\frac{1}{2} - 42\frac{3}{4} + 16\frac{5}{6}) \times 18$.

10. How many steps $1\frac{1}{2}$ feet high in a stairway 18 feet high?

11. How many days will a man have to work to earn $\$640$, if he earns $\$2\frac{2}{3}$ a day?

12. A money drawer has in it $\$68\frac{3}{4}$. How many days will it take to empty it if I take $\$1\frac{3}{4}$ from it daily?

13. Among how many persons can I distribute $\$937\frac{1}{2}$, giving to each person $\$1\frac{7}{8}$?

14. How many days in a year? How many working days? A man earns daily $\$1\frac{3}{4}$, and his expenses are on an average $\$1\frac{1}{3}$ a day. How much does he save in a year?

15. If a watch loses $13\frac{1}{2}$ seconds a day, how many minutes will it lose in the month of January?

16. Four boys earn a certain sum of money selling papers. The first earns $\frac{1}{6}$ of the whole, the second $\frac{1}{3}$, the third $\frac{1}{4}$, and the fourth the rest. What part of the whole does the fourth boy earn? If the first boy's earnings were 20 cents, what can you say of the earnings of the others?

17. If $\frac{1}{12}$ of a lot of goods is worth $\$360$, what is $\frac{1}{3}$ of the lot worth? $\frac{1}{4}$ of it? $\frac{3}{8}$ of it?

1. A cart loaded with coal weighs 2342 lb. The cart alone weighs 624½ lb. How much does the coal weigh? What is it worth at the rate of ¼ of a cent a pound?

2. If from *A* to *B* it is 3½ miles, and from *B* to *C* 2½ times as far, how far is it from *A* to *C*?

3. If it is 964½ miles from New York to Chicago, and 2½ times as far as that from Chicago to San Francisco, how far is it from Chicago to San Francisco? How far from New York to San Francisco?

4. A flagstaff 37⅔ ft. high was broken off so that it measured 29¾ ft. How long was the piece that was broken off?

5. A grocer bought molasses at the rate of $⅜ a gallon, and sold it at $½ a gallon. How much does he make on a barrel measuring 35 gallons?

6. If a man walks 3 miles an hour, how many miles will he walk in 4½ hours? How long will it take him to walk 4½ miles?

7. If a boy walks 2½ miles an hour, how far will he walk in 4 hours? How long will it take him to walk 4 miles?

8. A boy walks 2½ miles an hour. How long will it take him to walk 7½ miles? How far will he go in 7½ hours?

9. A railroad train which runs at the rate of ¾ of a mile a minute will go how far in 4 h. 20 min.? How long will it take it to run 100 miles?

1. A horse trots 8 miles an hour. How far at the same rate will he trot in 8 h. 15 min.?

2. Going at an average rate of $\frac{2}{3}$ of a mile a minute, how long will it take a train to run from Boston to Chicago, a distance of 1050 miles?

3. The rainfall in a certain city of Mexico during 1891 was as follows: January, $\frac{3}{4}$ in.; February, 0; March, 1 in.; April, 2 in.; May, $3\frac{1}{2}$ in.; June, $1\frac{2}{3}$ in.; July, 0; August, $\frac{2}{3}$ in.; September, $1\frac{1}{2}$ in.; October, $\frac{1}{4}$ in.; November, $\frac{1}{6}$ in.; December, $\frac{1}{2}$ in. What was the entire rainfall for the year? Difference between January and May? September and December?

4. The amount of rainfall during the year 1890 in Mobile was $64\frac{1}{10}$ in.; in San Diego, $11\frac{2}{10}$ in.; in New Orleans, 64 in.; in Yuma, Arizona, $3\frac{1}{10}$ in.; in Chicago, $32\frac{1}{5}$ in.; in Baltimore, $44\frac{1}{5}$ in.; in St. Paul, $27\frac{4}{5}$ in. Find out as many facts as you can from the above figures.

5. Rates of letter postage to any part of the United States are "two cents per ounce or fraction thereof," and on printed books, pamphlets, etc., the postage is "one cent for each two ounces or fraction thereof." What is the postage on the following articles: 1 letter, $3\frac{1}{2}$ oz.? 1 book, $5\frac{1}{3}$ oz.? 1 sealed letter, $5\frac{1}{4}$ oz.? a package of circulars weighing $1\frac{1}{3}$ lb.? a package of books, $3\frac{3}{4}$ lb.?

6. $12\frac{3}{4}$ yd. were sold from a piece of cloth measuring $20\frac{1}{2}$ yd. What cost the remainder at \$$\frac{2}{3}$ a yard?

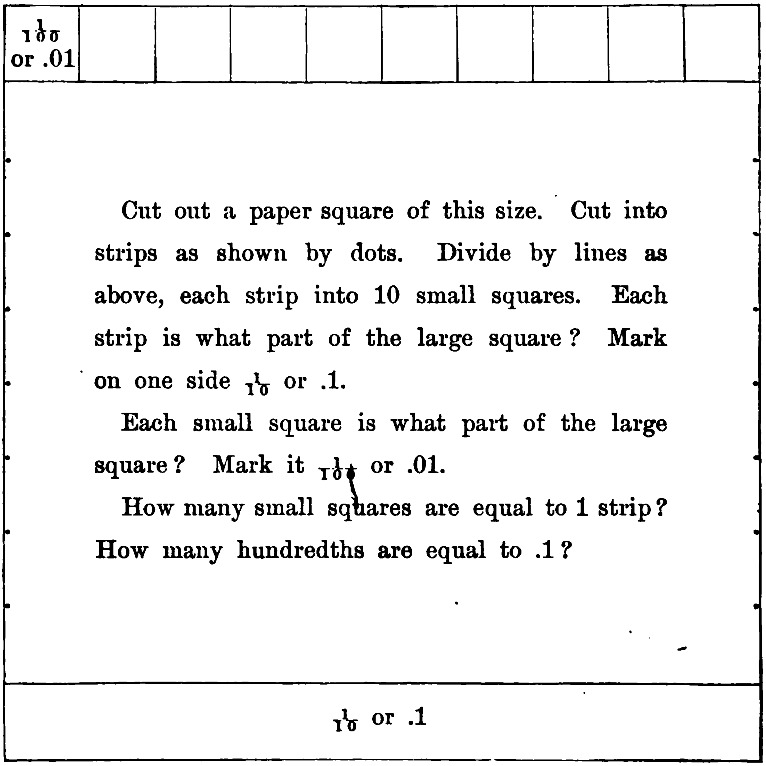
7. Cost of 3 pk. 5 qt. of apples at 20¢ a peck?

8. At \$$\frac{7}{8}$ a bu., how many bu. of corn can I buy for \$40?

SECTION V.

DECIMAL FRACTIONS TO THOUSANDTHS.

Oral and Written Exercises.



Cut out a paper square of this size. Cut into strips as shown by dots. Divide by lines as above, each strip into 10 small squares. Each strip is what part of the large square? Mark on one side $\frac{1}{10}$ or .1.

Each small square is what part of the large square? Mark it $\frac{1}{100}$ or .01.

How many small squares are equal to 1 strip? How many hundredths are equal to .1?

1. 7 strips are what part of the large square?
2. 1 small square is what part of the large square?
3. 18 small squares are what part of the large square?

Read the following:

1. 2 strips are .2 of the large square.

2. 3 strips are .3 of the large square.

3. 7 strips are .7 of the large square.

4. 1 small square is .01 of the large square.

5. 7 small squares are .07 of the large square.

6. 18 small squares are .18 of the large square.

7. 42 small squares are .42 of the large square.

8. Write in figures what represents 4 strips; 6 strips; 3 small squares; 56 small squares; 10 small squares; 50 small squares; 1 strip and 2 small squares; 3 strips and 6 small squares; 7 strips and 5 small squares.

9. Show by strips and squares what are represented by .4; .8; .08; .12; .23; .42; .87.

10. How many strips in 23 small squares? in 46 small squares? in 63 small squares? in 94 small squares?

11. How many tenths and hundredths in .23? in .46? in .63? in .94?

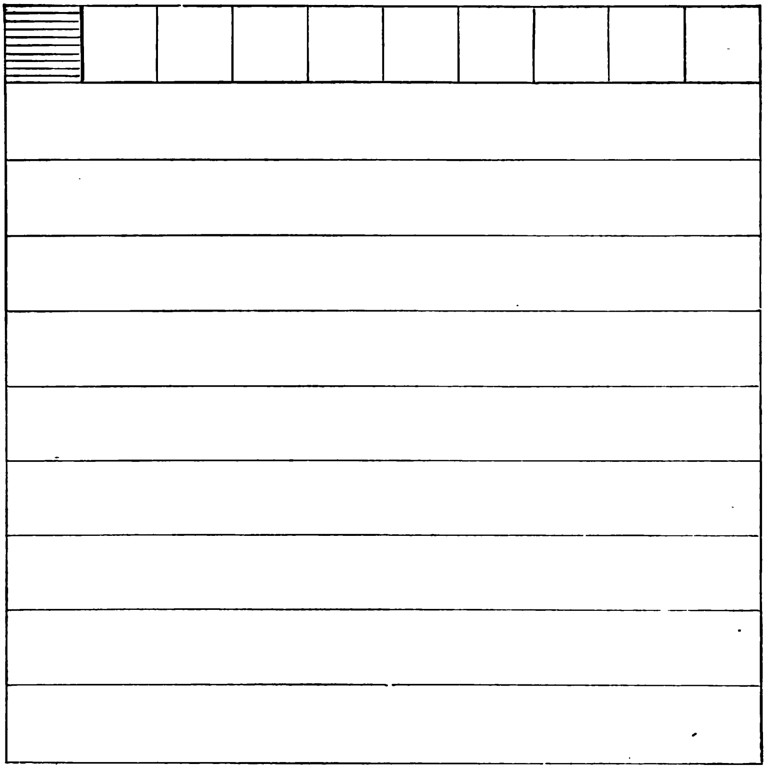
12. Read in units, tenths, and hundredths: .4; 4.4; 3.9; .06; .19; 7.02; 8.05; 9.17; 3.25; 17.08; 83.83.

13. Write in decimal form: $\frac{1}{10}$; $\frac{3}{10}$; $\frac{4}{100}$; $\frac{11}{100}$; $\frac{24}{100}$; $\frac{7}{100}$; $\frac{70}{100}$; $1\frac{4}{10}$; $1\frac{8}{100}$; $6\frac{14}{100}$; $8\frac{47}{100}$.

14. Express in decimals of a dollar 10¢; 18¢; 25¢; 64¢; 1¢; 8¢.

15. Read the dollars, dimes, and cents in the following numbers: $1.28 (one dollar, two dimes, eight cents); $6.43; $9.75; $10.05.

16. Read the dimes and cents in the last exercise as decimals of a dollar.



1. Dividing the small square into ten equal parts or slips, one slip is what part of the small square? How many slips are equal to the large square? What part of the large square is one slip? Representing the large square by 1., one strip or one-tenth is how represented? One small square or one hundredth is how represented? One slip or one thousandth is how represented? Represent by figures: 2 slips; 5 slips; 8 slips. Represent by figures 2 small squares and 6 slips.

1. Write in figures: One dollar eighty-three cents and five mills; twelve cents and four mills; twenty cents and six mills; eight mills.

2. 1 mill is what part of a cent? What part of a dollar? 8 mills is what part of a dollar?

3. How many tenths, hundredths, and thousandths in .625? .834? .906? .007? .076?

4. Read the above decimals in thousandths.

5. Write decimally; $\frac{7}{10}$; $\frac{80}{100}$; $\frac{8}{1000}$; $\frac{601}{1000}$; $\frac{78}{1000}$; $\frac{804}{1000}$; $\frac{96}{1000}$; $\frac{7}{1000}$.

6. Copy and read: .17; .60; .679; .835; .706; .086; .009; .803; .031; .060; .007.

7. Express decimally: 8 tenths; 16 hundredths; 329 thousandths; 43 thousandths; 8 thousandths; 306 thousandths; 17 thousandths; 500 thousandths.

8. Copy and read: 1.8; 1.08; 4.008; 3.081; 17.400; 83.010; 20.001; 170.017.

9. Express decimally: Ten and twelve hundredths; eighty and five hundred five thousandths; twelve thousandths; fifty and five thousandths; sixty-five thousandths; four hundred six thousandths.

10. Express decimally: $1\frac{1}{10}$; $1\frac{10}{100}$; $10\frac{1}{100}$; $100\frac{1}{10}$; $10\frac{1}{1000}$; $50\frac{500}{1000}$; $\frac{43}{1000}$.

11. Express decimally: 8 tenths; 25 thousandths; 105 hundredths; 120 tenths; 1005 hundredths; 1005 thousandths; 12,505 thousandths; 1 thousandth; 405 hundredths; 1001 hundredths.

12. How many tenths in 3 units? in 12 units? in 100 units? in 6 units and 4 tenths.

13. How many hundredths in .4? in .7? in .5?

1. How many thousandths in .2? in .02? in 2.? in .34? in 80? in 74?

2. How many tenths in 8? in .80? in .800? in 1.5? in 1.50? in 1.500?

3. How many hundredths in 6? in .6? in .600? in .360? in 4.4? in .800? in 1.46? in .060? in .360?

4. Reduce and express decimally the following: $\frac{3}{5}$; $\frac{3}{4}$; $\frac{2}{8}$; $\frac{4}{5}$; $\frac{7}{10}$; $\frac{1}{8}$; $4\frac{1}{2}$; $\frac{7}{8}$; $\frac{9}{12}$; $1\frac{3}{8}$.

5. Reduce to common fractions in lowest terms: .5; .25; .40; .75; .10; .250; .500; .800; .005; .50.

6. Reduce to hundredths: $\frac{1}{2}$; $\frac{1}{4}$; $\frac{3}{4}$; $\frac{1}{8}$; $\frac{3}{8}$; $\frac{5}{8}$; $\frac{7}{8}$; $\frac{1}{3}$; $\frac{2}{3}$; $\frac{1}{6}$

7. Reduce to hundredths: $\frac{5}{6}$; $\frac{1}{12}$; $\frac{5}{12}$; $\frac{7}{12}$; $\frac{11}{12}$; $\frac{1}{9}$; $\frac{2}{9}$; $\frac{4}{9}$; $\frac{5}{9}$; $\frac{8}{9}$.

8. Reduce to thousandths: $\frac{1}{4}$; $\frac{1}{8}$; $\frac{3}{8}$; $\frac{7}{8}$; $\frac{1}{3}$; $\frac{2}{3}$; $\frac{2}{5}$; $\frac{1}{6}$; $\frac{5}{6}$; $\frac{1}{7}$.

9. Express decimally: Two and three thousandths; forty-seven thousandths; four and four hundred forty thousandths; ten and one hundred five thousandths; thirty and three hundred three thousandths; seventy and six hundred seventy thousandths; eighty and eight thousandths.

10. In the number 44.444, give the value of each figure. How much greater value is expressed by the first figure than by the second? by the second than by the third? by the third than by the fourth?

11. What part of 4 is 4 tenths? What part of 4 tenths is 4 hundredths?

12. Express decimally: 4 hundredths. By removing the point one place to the right, what is done?

1. Express 4 tenths decimally. What effect has it to remove the point one place to the right? How much larger is the number than it was before?

2. Compare 4., .4, .04, and .004.

3. Compare .4 and .40; .40 and .400. What effect is produced by annexing a cipher to a decimal?

4. Compare .4 and .04; .04 and .004. What effect is produced by removing the decimal point one place to the left?

5. Write and add 4 tenths of a dollar, 3 tenths of a dollar, and 8 tenths of a dollar.

6. Write and add 25 hundredths of a dollar, 40 hundredths of a dollar, and 75 hundredths of a dollar.

7. Write and add 365 thousandths of a dollar, 463 thousandths of a dollar, and 75 thousandths of a dollar.

8. Add .4, .03, and .006; 7., .8, and .09.

9. Place in a vertical column, add, and explain: 6., .5, .3, .4; .06, .08, .09, .05; 40., .8, .09, .75, .83, .42.

10. Add 4.634, .308, 54,065, 7.84, 9.863.

11. Add .407, 3.086, 70.194, 6.05, 207.8, 9.004, 80.307.

12. Add 86.074, 69.005, 3.694, .783, 460.083, 37.008.

13. Add sixteen hundredths, forty-two and eighty-four thousandths, ten and seven hundredths, fifty-nine and eight thousandths, twelve and four hundred six thousandths.

14. Add eighteen and seven hundredths, fifty and six tenths, two hundred seven and eight thousandths, five hundred eight thousandths, nine hundred fifty-seven thousandths, eighty-nine and six tenths, forty and seventy-six hundredths.

1. From the large square take one strip. Represent by figures what you have done. (See page 62.)

2. From the large square take four strips. Represent by figures what you have done.

3. From one strip take one small square. Represent by figures what you have done.

4. From one strip take eight small squares. Represent by figures what you have done.

5. From one small square take three slips. Represent by figures what you have done.

6. Show what is represented by the following: 1 − .2; .4 − .2; .10 − .06; .18 − .12; .01 − .001; .04 − .023; .034 − .016.

Write in decimals and perform the following:

7. From 45 hundredths take 3 tenths.

8. From 6 tenths take 34 hundredths.

9. From 4 and 24 hundredths take 5 tenths.

10. From 8 and 264 thousandths take 12 hundredths.

11. From 379 thousandths take 28 hundredths.

12. From 6 and 2 tenths take 342 thousandths.

13. From eight hundred three thousandths take seventy-four hundredths.

14. From sixteen and four hundredths take three hundred nine thousandths.

15. 28.001 − .75 = ? 83.074 − 9.008 = ?
16. 680.08 − 39.089 = ? 83.42 − 7.096 = ?
17. 149.007 − 83.86 = ? 87.6 − 9.009 = ?
18. 93.01 − 7.809 = ? 94.002 − 7.694 = ?
19. 300.007 − 9.69 = ? 32.507 − 5.808 = ?

1. From 18.384 tons of coal there were used 8.108 tons. How much was left?

2. A man who owned .75 of a ship sold .225 of it. What part of the ship did he still own?

3. I ordered six tons of coal. Three loads were brought weighing respectively 1.37 T., 2.026 T., 2.109 T. How much remains to be brought?

4. A silver dollar weighing 412.5 grains and containing 41.25 grains of copper has how much pure silver?

5. From a cask containing 42.275 gal. of molasses there were drawn at different times 1.12½ gal., 4.37½ gal., .75 gal., 8.625 gal. How much remained?

6. From a quarter-section of land (160 acres) there was sold 62.045 acres at one time, and 18.7 acres at another time. How many acres remained unsold?

7. 5 strips × 2 = — strips. (See page 62.) .5 × 2 = ?

8. 8 strips × 2 = — strips = — large squares and — strips. .8 × 2 = ?

9. 3 strips and 6 small squares × 2 = ? .36 × 2 = ?

10. 8 strips and 4 small squares × 3 = ? .84 × 3 = ?

11. 3 slips × 2 = ? .003 × 2 = ?

12. 8 slips × 2 = ? .008 × 2 = ?

13. 2 small squares and 3 slips × 2 = ? .023 × 2 = ?

14. 3 small squares and 7 slips × 2 = ? .037 × 2 = ?

15. 6 small squares and 8 slips × 2 = ? .068 × 2 = ?

16. 4 small squares and 6 slips × 3 = ? .046 × 3 = ?

17. 2 strips, 3 small squares, and 4 slips × 2 = ? .234 × 2 = ?

18. 2 strips, 3 small squares, and 9 slips × 2 = ?

19. 3 strips, 6 small squares, and 8 slips × 2 = ?

Multiply:

1.	**2.**	**3.**	**4.**	**5.**
.08	.008	.036	.148	.346
4	4	6	8	7
6.	**7.**	**8.**	**9.**	**10.**
.38	.75	.069	.406	.514
5	9	8	3	6
11.	**12.**	**13.**	**14.**	**15.**
.635	.743	.659	.835	1.674
9	7	8	8	3
16.	**17.**	**18.**	**19.**	**20.**
.754	.834	.605	.702	.837
12	16	18	26	25
21.	**22.**	**23.**	**24.**	**25.**
1.67	1.396	3.046	2.709	4.739
15	28	24	38	32
26.	**27.**	**28.**	**29.**	**30.**
6.094	7.068	9.009	16.07	109.6
42	38	45	43	54
31.	**32.**	**33.**	**34.**	**35.**
30.75	56.038	807.6	76.384	406.09
38	46	58	28	72
36.	**37.**	**38.**	**39.**	**40.**
46.384	58.009	38.072	65.806	38.780
38	75	49	86	94

1.	**2.**	**3.**	**4.**	**5.**
60.109	73.083	40.008	73.086	85.069
× 84	× 65	× 55	× 93	× 86

6. .6 × 10 = ? 6.4 × 10 = ? .64 × 10 = ?
7. .06 × 10 = ? .064 × 10 = ? 1.064 × 10 = ?
8. .03 × 100 = ? .003 × 100 = ? .034 × 100 = ?
9. 6.3 × 100 = ? 8.07 × 100 = ? 9.65 × 100 = ?
10. 70.3 × 100 = ? 80.04 × 100 = ? 806.6 × 100 = ?
11. 8.034 × 100 = ? 7.009 × 100 = ? 30.008 × 100 = ?
12. 800.6 × 100 = ? 30.06 × 100 = ? 780.09 × 100 = ?
13. 68.4 × 10 = ? 8.069 × 10 = ? 9.406 × 10 = ?
14. 68.4 × 20 = ? 8.069 × 20 = ? 9.406 × 20 = ?
15. 3.94 × 30 = ? 4.506 × 30 = ? 8.602 × 30 = ?
16. 82.4 × 100 = ? 82.4 × 50 = ? 8.24 × 50 = ?
17. 5.42 × 50 = ? 6.84 × 50 = ? 4.86 × 50 = ?
18. 3.28 × 25 = ? 4.48 × 25 = ? 6.6 × 25 = ?
19. 8.04 × 50 = ? 64.2 × 25 ? 9.4 × 25 = ?
20. $75 × 100 = ? $8.40 × 100 = ? $64.20 × 100 = ?
21. $87.10 × 10 = ? $7.08 × 10 = ? $8.09 × 100 = ?
22. $4.08 × 100 = ? $8.65 × 10 = ? $9.75 × 10 = ?
23. $8.40 × 50 = ? $76.40 × 50 = ? $86.30 × 50 = ?
24. $7.06 × 50 = ? $8.04 × 25 = ? $6.08 × 25 = ?
25. $80.06 × 50 = ? $70.04 × 50 = ? $8.006 × 50 = ?

26. ½ of 8 strips is how many strips? (See page 62.) ½ of .8 = ? .8 ÷ 2 = ?

27. ½ of 7 strips is how many strips and small squares? ½ of .7 = ? .7 ÷ 2 = ?

28. ¼ of 6 strips is how many strips and small squares? ¼ of .6 = ? .6 ÷ 4 = ?

1. $\frac{1}{3}$ of 6 strips and 3 small squares = ? (See page 62.) $\frac{1}{3}$ of .63 = ? .63 ÷ 3 = ?

2. $\frac{1}{3}$ of 8 strips and 4 small squares = ? .84 ÷ 3 = ?

3. $\frac{1}{6}$ of 12 strips and 6 small squares = ? 1.26 ÷ 6 = ?

4. $\frac{1}{4}$ of 8 strips, 4 small squares, and 4 slips = ? .844 ÷ 4 = ?

5. $\frac{1}{4}$ of 5 strips, 2 small squares, and 8 slips = ? .528 ÷ 4 = ?

6. $\frac{1}{6}$ of 3 strips, 2 small squares, and 4 slips = ? .324 ÷ 6 = ?

7. Divide .84 by 2; by 3; by 4; by 6.

8. Divide 6.48 by 3; by 9; by 2; by 12.

9. Divide 4.08 by 2; by 8; by 3; by 12.

10. Divide 6.075 by 5; by 3; by 9.

11. Divide 10.008 by 4; by 8; by 3; by 9.

12. Divide 557.694 by 4; by 3; by 9; by 18.

13. Divide 60.900 by 3; by 30; by 300.

14. Divide 27.9 by 30; by 300; by 90.

15. What part of 1 square is .1 of 2 squares? .1 of 3 squares? .1 of 7 squares?

16. .1 of 5 squares = how many strips? What part of a square? .1 of 20 squares = ? .1 of 50 squares = ? .2 of 20 squares = ? .2 of 50 squares = ? .4 of 80 squares = ? .8 of 100 = ?

17. 5 × .1 = ? 20 × .1 = ? 50 × .1 = ? 20 × .2 = ? 50 × .2 = ? 80 × .4 = ? 100 × .8 = ?

18. 60 × .5 = ? 40 × .8 = ? 80 × 1.2 = ? 60 × 2.4 = ? 90 × 1.9 = ? 120 × .8 = ?

19. 80 × .6 = ? 180 × 4.5 = ? 680 × 3.4 = ? 490 × 6.2 = ? 860 × 12.5 = ?

1. 690 × 14.3 = ? 580 × 18.8 = ? 1760 × 8.6 = ? 1240 × 14.8 = ? 2760 × 18.6 = ?

2. 9370 × 7.9 = ? 4870 × 24.8 = ? 3840 × 18.6 = ? 4780 × 47.8 = ? 9370 × 44.8 = ?

3. .1 of 4 strips = how many small squares? What part of a strip? .1 of 20 strips = ? .1 of 40 strips = ? .1 of 80 strips = ? .2 of 20 strips = ? .2 of 80 strips = ? .2 of 60 strips = ?

4. .4 × .1 = ? 2. × .1 = ? 4. × .1 = ? 8. × .1 = ? 2. × .2 = ? 8. × .2 = ? 6. × .2 = ?

5. .1 of 4 squares and 4 strips = ? 4.4 × .1 = ?

6. .1 of 8 squares and 6 strips = ? 8.6 × .1 = ?

7. .2 of 4 squares and 4 strips = ? 4.4 × .2 = ?

8. .2 of 8 squares and 6 strips = ? 8.6 × .2 = ?

9. .4 of 8 squares and 6 strips = ? 8.6 × .4 = ?

10. .6 of 4 squares and 8 strips = ? 4.8 × .6 = ?

11. .8 of 3 squares and 4 strips = ? 3.4 × .8 = ?

12. Tenths of units give what? Tenths of tenths give what?

13. 8.4 × .9 = ? 7.6 × .6 = ? 9.3 × .4 = ? 12.8 × .5 = ? 42.5 × .4 = ? 32.9 × 1.5 = ?

14. 69.8 × 3.2 = ? 47.9 × 6.4 = ? 83.2 × 7.4 = ? 89.8 × 16.4 = ? 72.8 × 24.5 = ?

15. 54.3 × 25.8 = ? 164.9 × 27.6 = ? 435.6 × 24.3 = ? 876.8 × 34.8 = ? 307.8 × 48.5 = ? 40.9 × 124.2 = ?

16. .1 of 1 small square = how many slips?

17. .1 of 8 small squares = ? .08 × .1 = ?

18. .1 of 5 small squares = ? .05 × .1 = ?

19. .1 of 20 small squares = ? .20 × .1 = ?

20. .1 of 24 small squares = ? .24 × .1 = ?

1. Tenths of tenths give what? Tenths of hundredths give what?

2. $.08 \times .2 = ?$ $.12 \times .3 = ?$ $.24 \times .2 = ?$ $.30 \times .4 = ?$ $.48 \times .2 = ?$

3. $.46 \times .3 = ?$ $.85 \times .3 = ?$ $.45 \times .8 = ?$ $.78 \times 1.2 = ?$ $.83 \times 2.4 = ?$

4. $1.46 \times .8 = ?$ $6.84 \times .8 = ?$ $4.37 \times 1.2 = ?$ $8.69 \times 4.3 = ?$ $7.43 \times 8.2 = ?$

5. $8.06 \times 5.3 = ?$ $9.09 \times 6.6 = ?$ $7.84 \times 8.3 = ?$ $9.48 \times 12.6 = ?$ $18.69 \times 25.3 = ?$

6. $64.37 \times 42.8 = ?$ $95.63 \times 8.8 = ?$ $108.34 \times 5.4 = ?$ $107.09 \times 10.6 = ?$ $208.08 \times 100.9 = ?$

7. 3 large squares contain how many strips?

8. 2 strips have how many small squares?

9. In 2 large squares and 4 strips how many strips?

10. In 3 strips and 4 slips how many slips?

11. 2 strips are contained in 4 strips how many times? $.4 \div .2 = ?$

12. 3 small squares are contained in 9 small squares how many times? $.09 \div .03 = ?$

13. 2 slips are contained in 8 slips how many times? $.008 \div .002 = ?$

14. 2 strips are contained in 1 large square how many times? $1 \div .2 = ?$

15. 4 strips are contained in 2 large squares how many times? $2 \div .4 = ?$

16. 2 small squares are contained in 1 strip how many times? $.1 \div .02 = ?$

17. 4 slips are contained in 2 small squares how many times? $.02 \div .004 = ?$

By objects or drawings:

1. Divide 3. by 5.; by .5; by .2; by .05.
2. Divide .6 by .3; by .02; by .03; by .003.
3. Divide 1.2 by .4; by .6; by .03; by .006.
4. Divide 4.5 by .5; by .3; by .09; by 1.5
5. Divide .8 by .4; by .04; by 4; by .004.
6. Divide .08 by 4; by .4; by .04; by .004.
7. Divide 6.09 by 3; by .3; by .03; by .003.
8. Divide 10.5 by .5; by .05; by .005; by 5.
9. Divide 8.1 by .09; by 9; by .009; by .03.
10. Divide 60. by .03; by .004; by .2; by .12.
11. What part of 4 strips is 2 strips? $.2 \div .4 = ?$
12. What part of 4 squares is 2 strips? $.2 \div 4 = ?$
13. What part of 4 strips is 2 small squares? $.02 \div .4 = ?$
14. What part of 4 strips is 2 slips? $.002 \div .4 = ?$
15. What part of 3 small squares is 3 slips? $.003 \div .03$?
16. Divide .08 by 4; by .4; by .04; by .004.
17. Divide .108 by .09; by .009; by .9; by 9.
18. Divide 6.03 by .03; by .003; by 3; by .3.
19. Divide 10.08 by .06; by .006; by 6; by .6.
20. Divide 16. by .8; by .008; by .2; by .04.
21. Divide .6 by 6; by 60.; by .03; by .002.
22. Divide 12. by .2; by .006; by 120.; by 24.
23. Divide 1.8 by 9; by 18; by .003; by 30.

24.	**25.**	**26.**	**27.**
$12.5 \div .05$	$4.02 \div .003$	$8.7 \times .03$	$420 \div .07$
$2. \div .004$	$42. \div .03$	$15.03 \div .009$	$3.6 \div .06$
$20.06 \div .02$	$4.2 \div .03$	$7.08 \div .6$	$.8 \div 20.$
$8.01 \div .009$	$40.002 \div .3$	$.01 \div 2.$	$3.52 \div 1.6$

1.

$3.05 \div .5$
$18.06 \div .006$
$180.6 \div .06$
$3.3 \div .2$
$8.07 \div .02$

2.

$1.23 \div .5$
$70.2 \div .09$
$3.06 \div .009$
$10. \div .05$
$1.8 \div 20.$

3.

$6.04 \div .008$
$18.003 \div .03$
$7.105 \div .07$
$.6 \div .012$
$3. \div 1.2$

4.

$1.2 \div 30$
$40.8 \div 1.6$
$.05 \div .025$
$20. \div .05$
$1.08 \div 1.2$

5.

$6.4 \times .5$
$.006 \times 30$
$8 \div .05$
$16.02 \div .9$
$7.5 \times .02$

6.

308.3×5
2.008×60
$.03 \times 14.6$
270.8×8
$860.04 \div .09$

7.

$70.56 \div .006$
$3.03 \div .003$
$7. \div .08$
$4.1 \div .4$
6.03×4.6

8.

$308.8 \times .46$
$7.08 \div .003$
$3000. \times .009$
$.008 \times 400$
$90.06 \div .03$

9.

$(20.06+8.7) \times .8$
$(276.8-36.09) \times .5$
$(37.4-8.03) \div 30$
$(6.5+80.2) \div .03$
$(14.7-6.09) \times 4.6$

10.

$(7.08+28.9) \times 6.8$
$(.39+6.61) \div .04$
$(1.5-.68) \times 4.6$
$(7.5+18.5) \div .08$
$(4.906-.08) \times 40$

11.

$(9.03+81.87) \times .15$
$(75.65-4.37) \div .09$
$(4.683+7.8) \times 20$
$(6.008+4.128) \times .9$
$(8.47+.53) \div .009$

12. $48 \div 10 = ?$ $4.8 \div 10 = ?$ $.48 \div 10 = ?$
13. $8.6 \div 10 = ?$ $8.64 \div 10 = ?$ $.08 \div 10 = ?$
14. $56 \div 100 = ?$ $.6 \div 100 = ?$ $5.6 \div 100 = ?$
15. $8.4 \div 100 = ?$ $.7 \div 10 = ?$ $.7 \div 100 = ?$
16. $846 \div 100 = ?$ $64.3 \div 100 = ?$ $80.4 \div 100 = ?$
17. $93.7 \div 10 = ?$ $80.6 \div 10 = ?$ $47.6 \div 100 = ?$
18. $\$46.80 \div 10 = ?$ $\$8.09 \div 10 = ?$ $\$16.40 \div 10 = ?$
19. $\$43.06 \div 10 = ?$ $\$78.00 \div 100 = ?$ $\$80.60 \div 100 = ?$
20. $\$1 \div 50 = ?$ ¢ $\$62 \div 50 = ?$ — ¢ $\times 62 = ?$

1. $\$82 \div 50 = ?$ $\$56 \div 50 = ?$ $\$85 \div 50 = ?$

2. $\$460 \div 50 = ?$ $\$830 \div 50 = ?$ $\$426 \div 50 = ?$

3. $\$42 \div 25 = ?$ $\$34 \div 25 = ?$ $\$45 \div 25 = ?$

4. $\$70 \div 25 = ?$ $\$44 \div 25 = ?$ $\$56 \div 25 = ?$

5. $\$442 \div 25 = ?$ $\$342 \div 25 = ?$ $\$524 \div 25 = ?$

6. If 100 bbl. of flour cost $585, what cost 1 bbl.?

7. If 100 lb. of rice cost $8.50, what cost 1 lb.?

8. I pay $12.50 for 100 lb. of meat. What should I pay for 50 lb. at the same price? 25 lb.? 20 lb.?

9. If 50 bu. of potatoes cost $34, what cost 1 bu.?

10. At the rate of $68 a hundred, what will 1 penknife cost?

11. 25 doz. eggs cost $4.80, what cost 1 doz.?

12. 50 bbl. of sugar can be bought for $175. What cost 1 bbl.?

13. What will 4.1 barrels of oil cost at $6 a barrel?

14. I owned .1 of a factory, and sold .1 of my share. What part of the factory did I sell? What part of the factory do I still own?

15. A man walked on Monday 24.3 miles, on Tuesday 18.8 miles, on Wednesday 34.04 miles. How many miles did he walk in the three days?

16. If a note-book costs 5 cents, what part of a dollar does it cost, and what part of a dollar would 10 note-books cost?

17. If a hat costs $2.5, what will 20 hats cost at the same price?

18. If an orange costs 2 cents, how many can I buy for .4 of a dollar? How many for .04 of a dollar?

19. At 2¢ each, how many apples can I buy for $60?

1. There are 5.5 yards in a rod. How many yards in 20 rods? How many yards in .2 of a rod?

2. How many paces does a man take in going 50 feet, if his paces are 2.5 feet long?

3. At .06 of a dollar a pound, what will 50 pounds of sugar cost? What will 2.5 pounds cost?

4. If .2 of a pound of meat costs 4 cents, what will 1 pound cost? What will 6.4 pounds cost?

5. How many panes of fence 8.5 ft. long will it take to extend 170 ft.?

6. How many widths of carpet 2.5 ft. wide will exactly cover a floor 12.5 ft. wide?

7. I bought 8 doz. oranges and sold .25 of them. How many remain?

8. If .3 of a barrel of flour costs 1.8 dollars, what is the cost of 2.5 barrels?

9. .35 of a farm was sold for $700. What is the rest of it worth at the same rate?

10. What will 8.6 tons of coal cost at $6.40 a ton?

11. At .3 of a cent apiece, how many pencils can I buy for $6?

12. If a ship is worth $60,000, what is .6 of it worth? .75? .08?

13. There are 7.92 in. in a link of a surveyor's chain. How much less than a foot is it?

14. There are 100 links in a chain. How many inches long is the chain? How many feet?

15. There are 16.5 feet in a rod. How many feet in 48 rods? in 6.5 rods? in 18.4 rods?

16. How many rods in 66 ft.? in 1419 ft.?

SECTION VI.

MENSURATION.

Oral and Written Exercises.

1. Copy the following table upon slate or paper, and fill out blanks, first estimating the distance, then measuring and finding the difference between the estimate and the true distance. Measure long distances by pacing. In error column let + indicate the amount too long that you have estimated; – indicate the amount too short; 0 indicate that you were exactly right.

	Estimate.	Distance.	Error.
Height of teacher's desk	3 ft.	2 ft. 6 in.	6 in. +
Width of door			
Height of window....................................			
Length of school-room............................			
Width of school-room.............................			
Width of street in front of school-house			
Distance from school-house to post office..			
Distance from my home to the school-house			
Distance I can walk in an hour........			

How many:

1. Feet in 2½ yd.? 3 yd. 1 ft.? 100 in.? 4¼ yd.? 78 in.?

2. Inches in 6 ft. 4 in.? 8⅔ ft.? 1¾ yd.? 3 yd. 6 in.?

3. Yards in 68 ft.? 96 in.? 4½ rd.? 6 rd. 3 yd.?

4. Rods in 44 yd.? 1 mi.? 66 ft.? 50 yd.? 1 mi. 60 rd.?

5. Feet in ½ rd.? 4¾ rd.? 3 rd. 4 ft.? 18 yd.? 1 mi.?

6. Yards in 4.25 rd.? 100 ft.? 8 rd. 2 ft.? 12⅔ rd.? ½ mi.? 180.6 ft.?

7. Miles in 640 rd.? 5280 ft.? 3520 yd.? 21120 ft.? 1000 rd.?

8. Feet in 16⅔ rd.? 3¼ mi.? 6 mi.? 4½ rd.? 3 mi. 4⅔ yd.? 16.25 yd.? 125.5 rd.?

9. Feet in 1000 in.? 68.25 yd.? 1¾ mi.? 78 yd. 1½ ft.?

10. Yards in 75.25 rd.? 3¾ mi.? 720 in.?

11. Miles in 10,000 ft.? 1864 yd.? 5600 rd.? 78,060 ft.?

12. How many feet of bordering are needed for a room 18 ft. long 12¾ ft. wide? How many yards? (Draw plan.) Cost at 12½ ¢ a yard?

13. What will 18½ yd. of wire cost at 3 ¢ a foot?

14. A roll of ribbon 50 ft. long is worth what at 8 ¢ a yard?

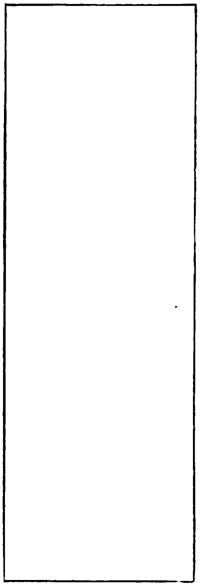
15. What is ¼ of 18 mi. 60 rd.? of 12 yd. 2 ft.?

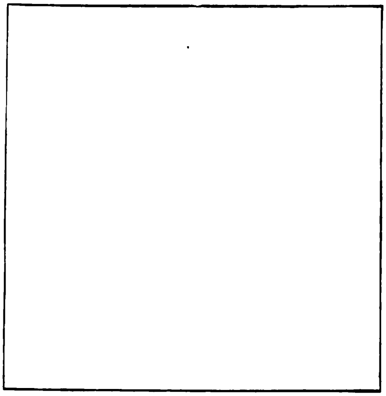
16. How many revolutions will a wheel 10 ft. in circumference make in going a mile?

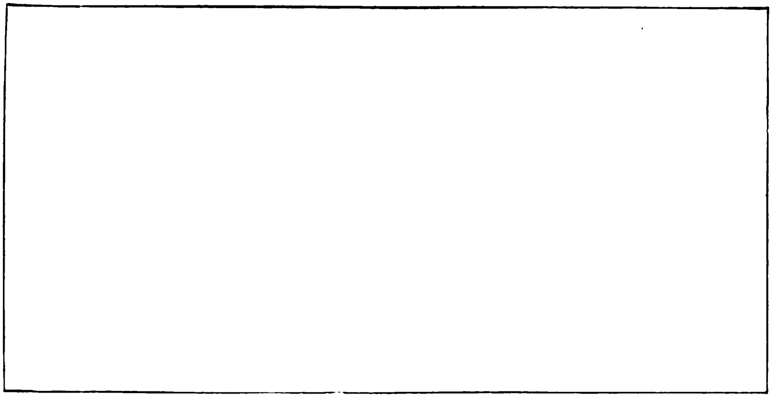
17. John lives 20 rd. from his school-house. How many times must he walk that distance to walk a mile?

18. Draw a figure one inch long and one inch wide. This contains one square inch. Draw a figure containing two square inches; four square inches.

1. Copy the following figures. Divide by lines into square inches. How many square inches in each figure? Make problems about each.







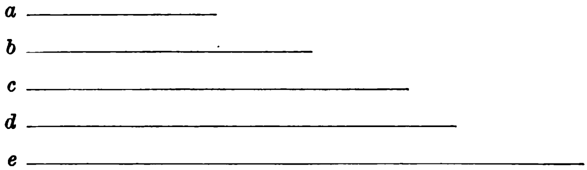
1. Draw a line 1 inch long, and let it represent a distance of 8 inches. By this scale of 8 inches to an inch draw lines representing 4 inches; 16 inches; 3 feet.

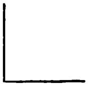
2. Draw a line 3 inches long, and let it represent a distance of 25 feet. To what scale is this line drawn?

3. By this scale draw lines representing 50 in., 25 in., $12\frac{1}{2}$ in., $8\frac{1}{3}$ ft., $16\frac{2}{3}$ ft.

4. By a scale of 20 feet to an inch draw lines representing 5 ft., 30 ft., 25 ft., 55 ft., 80 ft.

5. The following lines are reduced 24-fold. What distance does each line represent?





6. This is a square corner or right angle. Point out all the right angles you can find.

7. Measure the length and width of the top of your desk, and make a drawing of it by a scale of 1 foot to an inch. How many square inches in it?

8. Measure the length and width of your school-room, and make a drawing of the floor by a scale of 8 feet to an inch. How many square feet in it?

9. Draw a rectangle 1 ft. long and 1 ft. wide. This is a square foot. How many square inches in this square?
— sq. in. = 1 sq. ft.

10. A room 144 in. long and 96 in. wide is how many feet long and wide? How many square feet in the floor?

1. How many square feet in a piece of land 20 yd. long and 20 ft. wide?

2. How many square inches in 2 square feet?

3. How many square inches in the top of a table 2 feet square? (Draw plan.)

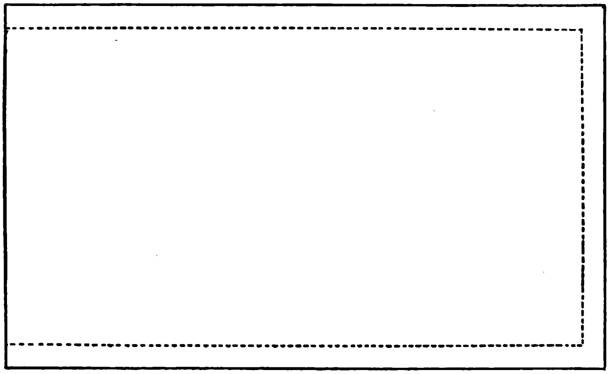
4. Draw a square 1 yard long and find out how many square feet in it. — sq. ft. = 1 sq. yd.

5. How many square yards in a floor 8 yd. by 10 ft.?

6. How many square yards in a floor 24 ft. by 100 in.?

7. The seat of a sofa is 2 yd. long and 20 in. wide. How many square yards of material will it take to cover it?

8. The following plan of a garden is drawn to a scale of 72 feet to an inch. How many yards of fencing will it take to inclose it on all sides?



9. The dotted lines indicate the inside boundary of a gravel walk. How much will it cost to make the walk at 20¢ a running yard?

1. How many steps 2 ft. 3 in. long will it take to walk around the outside of the foregoing lot? (Page 81.)

2. How many trees 9 ft. apart will it take to extend around on the inside border of the walk, a tree being set at each of the four corners?

3. How many square feet in the garden, including the walk? How many square yards?

4. How many square feet in the walk?

5. If $\frac{3}{4}$ of the garden is planted with vegetables and $\frac{1}{2}$ of the remainder with flowers, how many square yards are planted with flowers? (Draw diagram.)

6. A rectangular piece of land 20 ft. long and $8\frac{1}{2}$ ft. wide contains how many square feet? How many feet of fence will it take to fence it? (Draw diagram.)

7. A rectangular lot of land is $180\frac{1}{3}$ ft. long and $132\frac{1}{2}$ ft. wide. How many square feet in the lot? How many feet of fence will it take to fence it?

8. A lot of land $134\frac{1}{2}$ ft. front and $178\frac{1}{2}$ feet deep is worth how much at 14¢ a square foot? At the rate of 20¢ a running yard, how much will it cost to put a fence on two sides and one end of the lot?

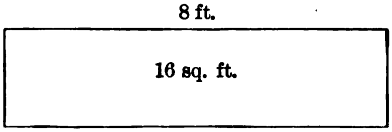
9. If B is $3\frac{1}{2}$ rd. east from A, and C is $2\frac{1}{3}$ rd. west from A, how far is it from C to B? (Draw diagram.)

10. The distance from A to C by the way of B is $49\frac{2}{3}$ mi. From A to B it is $21\frac{3}{4}$ mi. How far is it from B to C? If it is $36\frac{5}{6}$ mi. from C to D, how far is it from A to D? B to D? (Draw diagram.)

11. How many square yards of carpet 1 yd. wide will it take to cover the floor of a room 18 ft. long and 12 ft. 6 in. wide? How many yards?

1. My desk is $5\frac{1}{4}$ ft. long and $2\frac{1}{2}$ ft. wide. How many square feet in the top? (Draw plan.)

2. If the desk is $2\frac{1}{2}$ ft. high, how many square feet on one end? on the two ends? (Draw plan.)



3. The above rectangle represents a floor 8 ft. long. How wide must it be to contain 16 sq. ft.?

4. To what scale is it drawn?

5. If there are 21 sq. ft. in a door 3 ft. wide, how long is it?

6. In the top of a boy's desk there are 120 sq. in. It is 10 in. wide. How long is it? (Draw plan.)

7. If there are 600 sq. ft. in a floor that is 30 ft. long, how wide is it? (Draw plan.)

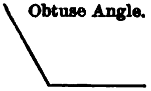
8. How long is a leaf of note paper that is $3\frac{3}{4}$ in. wide and contains 38 sq. in.?

9. A rectangular piece of land containing 5000 sq. ft. is 120 ft. wide on the street. How deep is it?

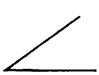
10. A board containing 10 sq. ft. is 8 in. wide. How many feet long is it?

11. A pavement 8 ft. wide is how long to contain 80 sq. yd.?

12. A room is 12.5 ft. long, 10.25 ft. wide, and 9.5 ft. high. How many square feet in the floor? How many square feet in the walls? How many square yards in the ceiling?

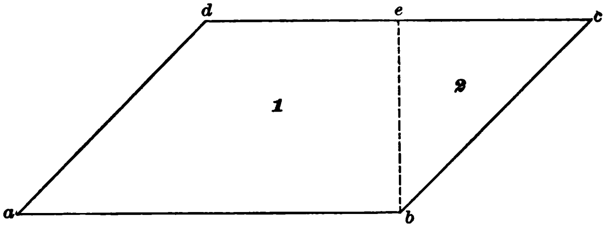


Obtuse Angle.

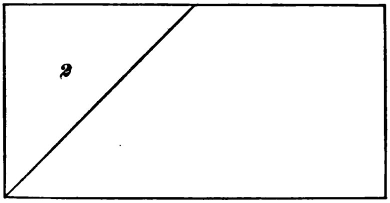


Acute Angle.

1. Describe an obtuse angle; an acute angle. Point out the obtuse angles in the following figure. Point out the acute angles.



2. The above figure is a parallelogram. Why? *eb* is the altitude. What is the base? Cut from paper a figure of the same shape and size. Cut in place of dotted lines, and arrange *2* thus:



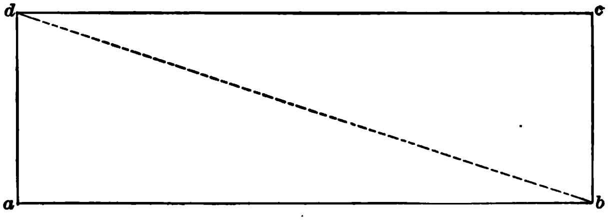
3. This is now a rectangle. Why? Measure the length and width. Find the area. The width of the rectangle formed from the parallelogram is the same as what of the parallelogram? How can we find the area of any parallelogram?

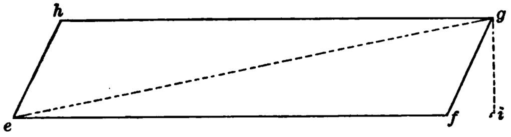
4. If the above plan (Exercise 1) is drawn 8 ft. to an inch, how many square feet does the parallelogram *abcd* measure?

1. A piece of land in the form of a parallelogram is 120 ft. long and has an altitude of 40 ft. Draw plan on a scale of 40 ft. to an inch and find how many square feet in the lot.

2. How many square yards in a floor having the form of a parallelogram whose sides measure 18 ft. and 12 ft. and whose altitude is 8 ft.?

3. Draw a plan of the "diamond" such as is used in playing baseball. How many square feet in it?



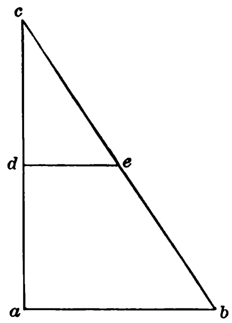


4. Cut from paper figures of the same shape and size as the above parallelograms. Cut in place of dotted lines or diagonals *b d* and *e g*. Compare the parts of each parallelogram. The triangle *a b d* is what part as large as the rectangle *a b c d*? The triangle *e f g* is what part as large as the parallelogram *e f g h*? Cut other parallelograms and compare in the same way.

5. What can you say of the size of a triangle and parallelogram having the same base and altitude?

1. If *abcd* on page 85 represents a lot of land 48 ft. long, and *efgh* represents a lot 36 ft. long, to what scale are the figures drawn? How many square feet in the rectangle *abcd*? How many square feet in the parallelogram *efgh*? How many square feet in the triangle *abd*? What is the altitude of the triangle *efg*? How many square feet in the triangle *efg*? Can you tell how you can find the area of any triangle?

2. What is the area of a triangular piece of land whose base is 60 ft. and altitude 40 ft.? (Draw plan to scale.)



3. How many square inches in a triangle 1$\frac{2}{3}$ ft. long at the base, with an altitude of 8 in.?

4. A triangular field 16 rd. long on the base has an altitude of 200 ft. How many square feet in it?

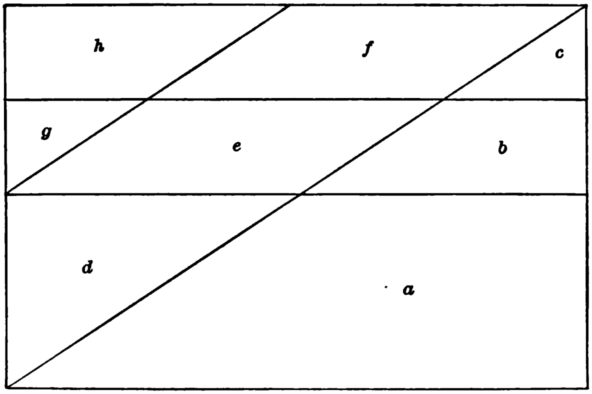
5. This triangle is drawn on a scale of 8 ft. to an inch. How long is *ab*? *ad*? *dc*? *de*? How can you find area of *abc*? of *cde*? of *abed*? What is the area of *abed*?

6. A floor in the form of a rectangle is 16$\frac{1}{2}$ ft. long, and contains 148$\frac{1}{2}$ sq. ft. How wide is the room?

7. A roll of carpeting 2 ft. 3 in. wide and 80 ft. long measures how many sq. ft.? How many sq. yd.?

8. How many square yards in a roll of matting 36 in. wide and 60 ft. long?

9. How many yards long is a roll of Brussels carpet containing 60 sq. yd., if the carpet is $\frac{3}{4}$ yd. wide?



1. This plan is drawn on a scale of 8 ft. to an inch. With a rule measure the dimensions of each of the above figures composing the rectangle. Find out, if you can, the area in square feet of each figure. Add the areas together and see if the sum agrees with the area of the rectangle.

2. How much will it cost to cement the floor of a cellar 20 ft. long and 18 ft. wide at 42¢ a square yard?

3. A gravel walk 8 ft. wide was made outside of a square lawn 40 ft. long. How many feet around the outside of this walk? How many square feet in the walk? How many square yards? (Draw plan to a convenient scale.)

4. Draw a plan 3 feet square. Draw another plan containing 3 square feet. Find the difference in area.

5. A floor 18 ft. long and 15 ft. wide has a painted border all round it 3 ft. deep. How many square feet in the unpainted part? How many square feet in the painted part? (Draw plan.)

1. A rectangular floor which requires 30 sq. yd. of carpeting to entirely cover it is 18 ft. long. How wide is it?

2. A square field 20 yd. long contains how many square feet? How many rods of fence will it take to inclose it?

3. How many square yards in one side of a room 20 ft. 6 in. long, 12 ft. high?

4. How many square yards in the walls of a room 18 ft. long, 12 ft. wide, and 9 ft. high? At 60¢ a square yard, what will a carpet for the room cost?

5. How many square yards in the walls and floor of a room 20 ft. 4 in. long, 15 ft. wide, and 12 ft. high?

6. How many square feet of surface on the outside of a box 3 ft. long, 2 ft. wide, and 1 ft. high?

7. How many square feet in the surface of a block of stone 18 in. long, 15 in. wide, and 12 in. high?

8. A lot of land whose rear boundary is parallel with the street is 180 ft. deep. The lot is 140 ft. wide on the street, and 110 ft. wide in the rear. How many square feet in the lot?

Measure, draw plans of, and make problems about:

9. The floor of your school-room and entries.

10. The walls and blackboards of your school-room.

11. The openings — windows and doors — of your school-room.

12. The school-yard and sidewalk in front of it.

13. The distance from your school-house to the post-office and other important points.

SECTION VII.

Business Transactions and Denominate Numbers.

1. The gold coins of the United States are the Eagle, Half Eagle, Quarter Eagle, Dollar piece, Double Eagle, and Three-Dollar piece. How much is each of these coins worth? State which of them you have seen.

2. The silver coins of the United States are the Dollar piece, Half Dollar, Quarter Dollar, Dime, and Half Dime. State the value of each piece.

3. A man had one of each of the gold and silver coins of the United States. Write the value in figures in a column and add.

4. What other United States coins have you seen, and of what are they made? Which of the above named gold and silver coins are not coined now?

5. What kinds of "paper money" have you seen, and what is printed on the paper?

6. Copy what is printed on any dollar bill or any other bill that you have or can borrow for the purpose.

7. Reduce to cents or cents and mills: \$½; \$¼; \$¾; \$⅓; \$⅔; \$⅕; \$⅖; \$⅗; \$⅘; \$⅙; \$⅚; \$⅛; \$⅜; \$⅝; \$⅞.

8. What part of a dollar is 25¢? 12½¢? 16⅔¢? 33⅓¢? 37½¢? 62½¢? 66⅔¢? 83⅓¢? 87½¢?

9. Cost of 16 articles @ 12½¢? 37½¢? 87½¢? \$6.50? \$3.75? 62½¢?

10. Cost of 24 articles @ 16⅔¢? 66⅔¢? \$2.33⅓? \$3.83⅓? \$4.62½? \$2.37½? \$5.75?

CASH ACCOUNT.

		Received.		Expended.	
1893.		$	¢	$	¢
July 3	*Cash on hand,*		*46*		
“ 3	*From father, for work done last week,*	*1*	*25*		
“ 4	*For candy, .20; for fire-crackers, .40,*				*60*
“ 6	*From Mr. Brown, for work, 4 hours,*		*40*		
“ 6	*For straw hat,*				*50*
“ 7	*From Mr. Brown, for work, 5 hours,*		*50*		
“ 8	*For paper, .05; for ball, .40,*				*45*
“ 8	*Balance on hand (at end of week),*			*1*	*06*
		2	*61*	*2*	*61*
July 10	*Cash on hand,*	*1*	*06*		

1. The above cash account of a boy is for one week, beginning Monday and closing with a correct balance Saturday night. Continue this account for one week, and balance the account, as before, on Saturday.

2. Rule paper for a cash account and make the following entries: On hand, $1.15. Bought at various times through the week the following articles: 1 box of lozenges, $1.08; 2 doz. pass books @ 40¢; 8 quires of paper @ 14¢; a tooth-brush for 30¢. Sold 80 rolls lozenges @ $1\frac{1}{2}$¢; 22 pass books @ 5¢; 140 sheets of paper @ 1¢ a sheet. Balance at the end of the week.

3. On hand, $75.86. Receipts: $4.50, $6.75, $ .98, $3.35, $14.90, $2.72, $19.32, $6.48, $1.58, $6.44, $17.25, $3.20, $5.00. Expenditures: $4.76, $18.39, $14.27, $ .85, $1.49, $2.56, $ .45, $3.60, $7.15, $2.92. Make out in full a monthly cash account using the above items.

Jamestown. Va., Sept. 1, 1893.

Francis Morse.

Bought of Jason Bradford & Co.

54 yd. Cloth	@ *$1.75*		
246 yd. Carpeting	@ *2.25*		
86 yd. Silk	@ *4.37½*		

Make out bills in full for the following, and receipt as clerk. Make the place your own town or city, and the time to-day:

1. James Soule bought of Burges & Keith, of Richmond, Ind., March 18, 1894, 130 lb. sugar @ 5½¢; 6 lb. coffee @ 35¢; 18 lb. cheese @ 12¢; 14 gal. molasses @ 45¢.

2. J. W. Willis bought of J. E. Soper & Co., October 1, 1893, 260 bu. corn @ 85¢; 694 bu. oats @ 35¢; 162 bbl. flour @ $5.40.

3. A. G. Scott sold to William Brown 24 pairs of shoes at $2.25 a pair; 38 pairs of boots at $3.50 a pair; 146 pairs of slippers at $1.25 a pair, and 60 pairs of overshoes at 90¢ a pair.

4. H. Cheney sold to S. E. Allen 42 cords of wood at $6.25 a cord; 28 tons egg coal at $6.50 a ton; 136 tons furnace coal at $6.25 a ton.

5. D. Arnold bought of G. B. Stone 226 lb. of beef at 15¢ a pound; 168 lb. of mutton at 12¢ a pound; 154 lb. of pork at 10¢ a pound.

6. E. S. Child & Co. bought of H. G. Whitney 486 bbl. apples @ $2.87½; 468 bu. potatoes @ 62½¢; 168 bu. wheat @ 66⅔¢.

A stock-farmer sold the following lots of cattle. Find the amount received for each lot:

1. *Lot No. 1.* 48 cows, average weight 860 lb., at $3\frac{1}{2}$¢ a pound.

2. *Lot No. 2.* 86 oxen, av. wt. 936 lb., at $4\frac{1}{2}$¢ a pound; and 27 cows, av. wt. 920 lb., at 4¢ a pound.

3. *Lot No. 3.* 76 cattle, average weight 960 lb., at $4\frac{3}{4}$¢ a pound.

4. *Lot No. 4.* 65 calves, av. wt. 130 lb., at $5\frac{1}{2}$¢ a pound; and 48 sheep, av. wt. 126 lb., at 5¢ a pound.

5. The gold coins of Great Britain are the Sovereign and Half-Sovereign. The sovereign is worth 1 pound, or about $4.86 of United States money. How much of our money is four and one-half pounds of English money worth? The sign for pounds is £.

6. One of the silver coins of Great Britain is the Crown. It is worth 5 shillings, or one-fourth of a pound. How many shillings in a pound? *s.* stands for shillings.

7. How many shillings are a sovereign and a crown worth? 3 sovereigns and 12 shillings?

8. How many crown pieces will it take to be worth a pound? 8 pounds? 6 pounds 5 shillings?

9. How many pounds in 60 shillings? 85 shillings?

10. How many shillings in £6 18*s.*? in £8 15*s.*

11. How many gold sovereigns will it take to be worth 100 shillings?

12. How much in our money is a shilling worth?

13. Reduce to United States money 6*s.*; 15*s.*; £1 10*s.*; £3 12*s.*; £8 15*s.*; £12 6*s.*; £2 $4\frac{1}{2}$*s.*

1. Avoirdupois Weight is used for weighing almost everything except gold and silver. Mention some things that are sold by the ounce; by the pound; by the hundredweight or cental; by the ton. From what you have already learned, fill blanks in the following:

2.

? oz. = $\frac{1}{2}$ lb.
? lb. = $\frac{1}{4}$ cwt.
? cwt. = $\frac{3}{4}$ T.
? lb. = $\frac{3}{8}$ T.

3.

$4\frac{1}{2}$ lb. = — oz.
$6\frac{3}{4}$ cwt. = — lb.
$3\frac{1}{4}$ T. = — cwt.
$6\frac{1}{2}$ T. = — lb.

4.

4 lb. 6 oz. = — oz.
8 lb. 7 oz. = — oz.
3 lb. 14 oz. = — oz.
4 lb. 15 oz. = — oz.

5.

20 oz. = — lb. — oz.
50 oz. = — lb. — oz.
80 oz. = — lb. — oz.
150 oz. = — lb. — oz.

6.

1 cwt. 50 lb. = — lb.
7 cwt. 90 lb. = — lb.
1 T. 6 cwt. = — lb.
5 T. 4 cwt. = — lb.

7.

2500 lb. = — T. — lb.
3000 lb. = — T. — cwt.
4800 lb. = — T. — lb.
6500 lb. = — T. — cwt.

8.

1 cwt. = — oz.
1 cwt. 10 lb. = — oz.
1 T. 6 cwt. = — oz.
1 T. 18 lb. = — oz.

9. How much less than 1 cwt. is 84 lb.? 67 lb.? 52 lb.? $62\frac{1}{2}$ lb.? 34 lb. 8 oz.?

10. How much less than 1 T. is 600 lb.? 1800 lb.? 9 cwt.? 634 lb.? 18 cwt. 200 lb.?

11. How many lb. in 18 oz. + 10 oz.? 24 oz. + 16 oz.?

12. How many lb. and oz. in 86 oz.? 112 oz.? 168 oz.? 78 oz. + 86 oz.? 134 oz. + 264 oz.?

1. How many centals in 138 lb.? in 154 lb. + 232 lb.? in 345 lb. + 627 lb.?

2. How many tons in 30 cwt.? in 15 cwt. + 17 cwt.? in 1840 lb. + 620 lb.? in 730 lb. + 2460 lb.?

Add:

3.	**4.**	**5.**	**6.**
2 lb. 4 oz.	7 lb. 6 oz.	8 lb. 10 oz.	4 lb. 12 oz.
3 lb. 6 oz.	8 lb. 4 oz.	2 lb. 6 oz.	3 lb. 7 oz.

7. 7 lb. 13 oz. + 2 lb. 8 oz. **8.** 6 lb. 12 oz. + 8 lb. 10 oz.
9. 7 lb. 14 oz. + 18 lb. 13 oz. **10.** 9 lb. 11 oz. + 8 lb. 12 oz.
11. 4 cwt. 20 lb. + 3 cwt. 30 lb. **12.** 4 cwt. 40 lb. + 6 cwt. 60 lb.
13. 1 cwt. 60 lb. + 2 cwt. 60 lb. **14.** 4 cwt. 80 lb. + 3 cwt. 90 lb.
15. 1 T. 600 lb. + 3 T. 200 lb. **16.** 5 T. 800 lb. + 4 T. 1200 lb.
17. 5 T. 1600 lb. + 3 T. 500 lb. **18.** 9 T. 1400 lb. + 7 T. 900 lb.

Subtract:

19.	**20.**	**21.**	**22.**
4 lb. 0 oz.	3 lb. 6 oz.	4 lb. 5 oz.	9 lb. 2 oz.
1 lb. 6 oz.	1 lb. 10 oz.	2 lb. 12 oz.	4 lb. 12 oz.

23. From 1 T. take 300 lb.; 8 cwt.; 1400 lb.
24. From 2 T. take 1 T. 6 cwt.; 1 T. 400 lb.

25. 3 T. 4 cwt. – 1 T. 8 cwt. **26.** 5 T. 600 lb. – 2 T. 1200 lb.
27. 8 T. 500 lb. – 3 T. 1400 lb.

28. 8 oz. × 2 = — lb. **29.** 8 oz. × 3 = — lb. — oz.
30. 50 lb. × 2 = — cwt. **31.** 80 lb. × 3 = — cwt. — lb.
32. 6 cwt. × 4 = — T. — cwt.

Multiply:

1.	**2.**	**3.**	**4.**
2 lb. 4 oz.	4 lb. 3 oz.	2 lb. 4 oz.	1 lb. 4 oz.
3	4	4	5

5. 6 lb. 6 oz. × 4.

6. 3 lb. 8 oz. × 4.

7. 4 lb. 9 oz. × 3.

8. 3 lb. 12 oz. × 3.

9. 5 lb. 9 oz. × 12.

10. 4 lb. 13 oz. × 9.

11. 8 lb. 7 oz. × 14.

12. 9 lb. 8 oz. × 15.

13. 3 T. 5 cwt. × 4.

14. 4 T. 3 cwt. × 8.

15. 5 T. 600 lb. × 3.

16. 8 T. 600 lb. × 4.

17. 6 T. 5 cwt. 10 lb. × 6.

18. 4 T. 14 cwt. 8 lb. × 8.

19. 9 T. 11 cwt. 12 lb. × 10.

20. $\frac{1}{2}$ of 1 lb. = how many oz.?

21. $\frac{1}{4}$ of 1 T. = how many cwt.? how many lb.?

22. 18 lb. ÷ 4 = — lb. — oz.

23. 27 lb. ÷ 6 = — lb. — oz.

24. 24 lb.÷9; 12 oz.÷9; 30 lb.÷8; 9 T.÷4; 18 cwt.÷5.

25. 23 T.÷10; 32 T.÷12; 15 T.÷12; 87 T.÷8.

26. What part of 1 lb. is 8 oz.? 12 oz.?

27. What part of 30 oz. is 15 oz.? 5 oz.? 10 oz.?

28. What part of 1 T. is 500 lb.? 250 lb.? 1500 lb.?

29. What part of 1 cental is 25 lb.? 75 lb.? 80 lb.?

30. What will 1 T. of sugar cost at $6 a cwt.?

31. What will 1 T. 300 lb. of flour cost at 3¢ a pound?

32. At 12¢ a pound, what will 8 oz. of cheese cost? 4 oz.? 12 oz.?

33. At $.20 a pound, what will 1 lb. 8 oz. of meat cost? 2 lb. 4 oz.? 3 lb. 12 oz.?

34. At $40 a ton, what will 500 lb. of iron cost? 1500 lb.? 250 lb.? 750 lb.?

Find the cost of:

1. 5 cwt. of butter at 30¢ a lb.

2. 1800 lb. of beef at $8 a cwt.

3. 2 T. 800 lb. of hay at $15 a T.

4. 6 lb. 12 oz. of cheese at 8¢ a lb.

Fill blanks in the following:

5.

2 bu. = — pk.
½ bu. = — qt.
1½ pk. = — pt.
12½ pk. = — qt.

6.

4 qt. = — pk.
4 qt. = — bu.
36 pt. = — pk.
64 qt. = — bu.

7.

3.5 bu. = — qt.
1.25 bu. = — pk.
.75 pk. = — pt.
4.5 pk. = — qt.

8.

1½ gal. = — pt.
2¾ gal. = — qt.
4⅔ qt. = — pt.
6⅝ gal. = — qt.

9.

2.5 qt. = — gi.
3.25 gal. = — qt.
.75 gal. = — pt.
4.5 gal. = — gi.

10.

100 gi. = — qt.
8 pt. = — gal.
½ pt. = — qt.
1⅞ gal. = — pt.

11.

3 bu. 2 pk. = — pk.
1 bu. 3 pk. = — qt.
6 bu. 6 qt. = — qt.
3 pk. 6 qt. = — pt.

12.

8 gal. 3 qt. = — qt.
2 gal. 1 qt. = — pt.
8 qt. 1½ pt. = — gi.
7 gal. 4 gi. = — pt.

13.

20 qt. = — gal. — qt.
46 qt. = — gal. — qt.
64 pt. = — gal. — qt. — pt.
86 gi. = — qt. — pt. — gi.

14. How many gal. in 7 qt. + 4 qt.? in 11 qt. + 6 qt.?

15. How many bu. in 6 pk. + 3 pk.? in 40 qt. + 20 qt.?

16. How many qt. in 16 gi. + 5 gi. + 8 gi. + 1 pt.?

Add:

1.	**2.**	**3.**	**4.**
3 bu. 1 pk.	1 bu. 2 pk.	6 bu. 5 pk.	5 bu. 1 pk. 3 qt.
2 bu. 2 pk.	4 bu. 2 pk.	3 bu. 4 pk.	3 bu. 0 pk. 6 qt.

5.	**6.**	**7.**	**8.**
6 gal. 3 qt.	8 gal. 7 qt.	5 gal. 4 qt. 1 pt.	8 qt. 1 pt. 2 gi.
4 gal. 5 qt.	3 gal. 4 qt.	4 gal. 6 qt. 0 pt.	6 qt. 1 pt. 3 gi.

9. Add 3 gal. 7 qt. + 4 gal. 1 pt. + 6 qt. 1 pt. + 3 qt. 3 gi.

10. Add $\frac{1}{4}$ bu. + 6 qt. + 2 bu. $3\frac{1}{2}$ qt. + 3 bu. $2\frac{1}{2}$ pk. + $8\frac{1}{2}$ qt.

11. Add 3 bu. 6 qt. + 3 bu. 2 pk. + 3 pk. 1 pt. + 6 qt. 1 pt.

12. Add $\frac{7}{8}$ pk. + $\frac{3}{4}$ bu. + $\frac{1}{2}$ qt. + $\frac{3}{4}$ pk. + $\frac{1}{4}$ qt. + $\frac{3}{4}$ pk.

13. From 1 bu. take 3 pk.; take 12 qt.; take $\frac{1}{4}$ pk.

Subtract:

14.	**15.**	**16.**	**17.**
4 bu. 3 pk.	6 bu. 0 pk.	4 bu. 1 pk.	6 pk. 3 qt.
2 bu. 1 pk.	3 bu. 1 pk.	1 bu. 3 pk.	2 pk. 5 qt.

18.	**19.**	**20.**	**21.**
6 gal. 6 qt.	8 gal. 0 qt.	12 gal. 3 qt.	8 gal. 4 qt. 0 pt.
2 gal. 3 qt.	4 gal. 1 qt.	6 gal. 6 qt.	3 gal. 5 qt. 1 pt.

22. From 4 gal. 1 pt. take $11\frac{1}{2}$ qt.; take 3 qt. 1 pt.

23. From $1\frac{3}{4}$ bu. take 3 pk. 4 qt.; take $3\frac{3}{8}$ pk.

24. From $7\frac{7}{8}$ pk. take 1 bu. 2 pk. 6 qt. 1 pt.

25. From $4\frac{1}{2}$ gal. take $1\frac{1}{3}$ gal.; take $4\frac{5}{6}$ qt.

26. 4 qt. × 8 = — gal.

27. 3 qt. 1 pt. × 2 = — qt. — pt.

28. 6 qt. × 10 = — pk. — qt.

29. 18 qt. × 9 = — bu. — pk. — qt.

30. 17 pt. × 12 = — gal. — qt. — pt.

Multiply:

1.	**2.**	**3.**	**4.**
3 bu. 1 pk.	5 gal. 3 qt.	5 bu. 1 pt.	3 qt. 4 gi.
4	6	16	24

5.	**6.**	**7.**	**8.**
5 gal. 1 pt.	6 bu. 6 qt.	$4\frac{1}{3}$ bu. 3 pk.	$6\frac{7}{8}$ gal. 3 qt.
30	16	12	20

9. $\frac{1}{3}$ of a bushel = — pk. — qt. — pt.
10. $\frac{2}{3}$ of a gallon = — qt. — pt. — gi.
11. 23 bu. ÷ 4 = — bu. — pk.
12. 43 gal. ÷ 6 = — gal. — qt. — pt.

Divide:

13.	**14.**	**15.**
3)24 gal. 3 qt.	8)18 bu. 0 pk.	8)60 pk. 3 qt.

16.	**17.**	**18.**
9)25 bu. 6 qt.	12)28 gal. 2 qt.	6)58 qt. 1 pt. 3 gi.

19. How many times are 4 quarts contained in 2 bushels?

20. To how many persons can I give 2 gal. of milk if I give 2 qt. to each person?

21. To how many persons can I give 3 bu. of corn if I give to each person 3 pk.?

22. If I divide 6 bu. of corn among 8 persons, how many quarts do I give to each person?

23. What will $8\frac{2}{3}$ gal. of milk cost at 6¢ a qt.?

24. What will $6\frac{3}{4}$ bu. of beans cost at 8¢ a qt.?

Find the cost of:

1. 360 qt. of molasses at 40¢ a gal.
2. 62 pk. of corn at $1.00 a bu.
3. 6⅔ bu. of potatoes at 30¢ a pk.
4. 2⅔ gal. of vinegar at 18¢ a qt.

5. What will 18 bu. 3 pk. corn cost at 62½¢ a bu.?

6. From a barrel of vinegar containing 31½ gal. there were taken at one time 6¾ gal., and at another time 12⅛ gal. What is the remainder worth at 7¢ a qt.?

7. A relief committee received from one person 18 bu. 6 qt. of wheat; from another, 16 bu. 3 pk.; from a third, 22 bu. 5 qt.; from a fourth, 14 bu. 2 pk. This was divided equally among 12 families. How many bushels, pecks, and quarts did each family receive?

8. A car-load of wheat weighing 14 T. 6 cwt. was sold for $429. Allowing 60 lb. to a bushel, what was the price per bushel?

9. How many seconds of time in 2⅔ min.? in 6¾ min.?

10. How many minutes in ⅔ h.? in ¾ h.? in 3½ h.?

11. How many hours in ¾ da.? in ⅜ da.? in 4⅞ da.?

12. How many days in January? July? September? August? April? November? October? February? March? May? June? December?

13. How many minutes is your school in session daily? how many hours weekly?

14. How many hours and minutes from 10.30 o'clock A.M. to 2 o'clock P.M.?

15. How many days from June 1 to June 21? to July 1? to July 20? to September 6?

1. A boy goes to bed at 8.30 in the evening, and gets up at 7 the next morning. How many hours and minutes is he in bed?

2. If a man gives $\frac{3}{8}$ of a day to work, $\frac{1}{3}$ of a day to sleep, and spends $2\frac{1}{2}$ hours every day reading, how many hours and minutes left for eating and recreation?

3. How many days in the spring months? in the summer months? in the autumn months? in the winter months? in the entire year?

4. How many months from April 1 to October 1? from February 1 to August 1? from September 10 to December 10?

5. How many months from July 20, 1893, to January 20, 1894? from September 23, 1893, to July 23, 1894?

6. How many months and days from September 1, 1893, to December 9, 1893? to January 15, 1894? to March 23, 1894?

7. How many days from July 24 to August 2? to September 9? to October 18?

8. How many months and days from March 20, 1894, to May 15, 1894? to July 4, 1894? to January 3, 1895?

9. How many years and months from July 1, 1891, to September 1, 1896?

10. How many years and months from September 22, 1892, to May 22, 1894?

11. How many years, months, and days from September 22, 1892, to May 31, 1894? to July 25? to August 5?

12. How many years, months, and days from October 18, 1892, to November 10, 1893? to April 19, 1896?

1. Find the age at death, in years, months, and days, of the following celebrated persons :

	Born.	Died.
George Washington,	Feb. 22, 1732.	Dec. 14, 1799.
Benjamin Franklin,	Jan. 6, 1706.	Apr. 17, 1790.
Daniel Webster,	Jan. 18, 1782.	Oct. 24, 1852.
Abraham Lincoln,	Feb. 12, 1809.	Apr. 15, 1865.
Ralph Waldo Emerson,	May 25, 1803.	Apr. 27, 1882.

2. Find the difference of time in the following quick passages from New York to Queenstown :

Teutonic,	5 da.	21 h.	3 min.
Alaska,	6 da.	21 h.	22 min.
Umbria,	6 da.	3 h.	4 min.

3. The Teutonic sailed from Queenstown to New York in 1891 in 5 da. 16 h. 31 min. How much less time is this than her eastward passage ?

4. If there are 2 reams in one bundle, and 5 bundles make 1 bale, how many reams in a bale ? in 6 bales ? in 40 bundles ?

5. How many quires in a bundle ? How many quires in a bale ? in 3 bales ?

6. How many sheets in 10 quires ? in 1 ream ? in 1 bundle ? in 1 bale ?

Fill blanks in the following :

7.

$12\frac{1}{2}$ bales = — reams.
160 reams = — bales.
20 reams = — quires.
200 quires = — reams.

8.

$1\frac{3}{4}$ bales = — reams.
$4\frac{2}{3}$ quires = — sheets.
3.1 reams = — quires.
$6\frac{7}{8}$ quires = — sheets.

Fill blanks in the following:

1.

$\frac{3}{4}$ bales = — reams.
400 quires = — reams.
640 sheets = — quires.
$1\frac{7}{8}$ bales = — quires.

2.

4.8 bales = — reams.
2.5 bales = — quires.
.025 bales = — sheets.
128.6 quires = — sheets.
4800 sheets = — reams.

3. How many reams and quires in

$4\frac{3}{4}$ bales + $3\frac{7}{8}$ bales + $12\frac{1}{2}$ reams?

4. How many reams in 10,000 quires?

5. How many quires in 11,520 sheets?

6. How many reams in 11,520 sheets?

7. From a bale of paper there was sold 3 reams. What is the remainder worth at $2.50 a ream?

8. From a stock of 168 bales of paper, there was taken at one time 150 reams 12 quires, and at another time 126 reams 16 quires. How much was the balance worth at $1.28 a ream?

9. What is the difference between 18 score and 15 dozen? 16 score and 22 dozen?

10. 12 dozen make a gross. How many dozen in $3\frac{2}{3}$ gross? in $8\frac{3}{4}$ gross?

11. I bought a gross of pens at the rate of $\frac{1}{4}$¢ apiece. How much did they cost?

12. How many boxes will it take to contain 6 gross of pens, if I put 3 dozen in a box?

13. I bought at one time 8 gross 6 dozen pencils, and at another time 150 dozen. How much are they worth at $2\frac{1}{2}$¢ apiece?

SECTION VIII.

Miscellaneous Oral and Written Exercises.

1. John bought 8½ lb. of fish at 10¢ a pound, and gave a dollar bill. What change did he receive?

2. At another time he bought ½ bu. of potatoes at 90¢ a bushel, and a peck of turnips for 25¢. He gave a two-dollar bill. What change did he receive?

A country merchant sold the following articles. What change in each case did he give?

3. 4½ lb. lard @ 10¢; 6 lb. sugar @ 7¢. Rec'd $1.

4. 2 bu. oats @ 45¢; 2 lb. starch @ 10¢. Rec'd $2.

5. 4 bu. corn @ 82¢; 1 lb. tea @ 65¢. Rec'd $5.

6. 6 lb. soap @ 9¢; 2 quires paper @ 15¢. Rec'd $2.

7. ½ lb. coffee @ 36¢; 4 lb. 4 oz. butter @ 40¢. Rec'd $5.

8. 12 lb. 12 oz. beef @ 16¢; cloth, $1.60. Rec'd $4.

9. 18½ yd. cotton cloth @ 8¢; peaches, 40¢. Rec'd $10.

10. Write in a column and add: $8.75, $65.06, $409.63, $758.28, $3.82, $69, $3.89, $.84, $785.90, $34.86, $56.83, $7.06, $5.69, $1096.15.

11. Write in a column and add: $38.75, $6.07, $8094.16, $238.74, $74.83, $489.62, $.82, $780, $54.86, $3.90, $42.86, $95.08, $16.98, $438.

12. Bought 864 barrels of flour at $5.75 a barrel, and paid $2684.15 towards it. How much more to pay?

Add by columns and by lines :

	1.	**2.**	**3.**	**4.**	**5.**	**6.**	**7.**	**8.**	**9.**	**10.**
11.	4	5	8	3	4	9	4	4	6	4
12.	8	3	3	5	7	3	5	4	4	5
13.	6	7	9	8	9	5	3	9	7	9
14.	9	4	6	9	3	8	6	3	1	8
15.	3	5	2	2	8	4	6	5	8	7
16.	5	6	8	9	8	8	7	7	2	3
17.	6	9	7	6	2	7	2	8	9	6
18.	9	7	5	8	7	1	3	1	7	1
19.	4	1	3	3	6	5	8	5	5	5
20.	2	3	6	7	1	6	7	2	6	9
21.	7	8	4	1	5	4	4	7	3	6
22.	6	6	7	7	6	2	1	9	4	8
23.	5	2	5	4	9	7	8	6	5	4
24.	8	9	9	5	3	6	9	8	3	7

	25.	**26.**	**27.**	**28.**	**29.**	**30.**	**31.**	**32.**
33.	28	43	75	68	72	39	16	67
34.	94	59	45	56	97	58	87	64
35.	48	96	93	92	64	35	18	18
36.	89	27	56	67	39	97	75	73
37.	73	82	84	14	85	43	32	25
38.	27	48	37	75	43	11	63	88
39.	62	73	72	23	28	66	29	36
40.	36	15	28	48	76	82	56	47
41.	59	61	66	84	15	29	44	97
42.	95	34	19	39	52	74	91	59
43.	86	59	94	85	68	29	38	46

1. Bought 540 acres of land at $25 an acre, and paid for it in flour at $7.50 a barrel. How many barrels did I give?

2. If the government were to pay off the national debt during a single year, how much must be paid a day on an average? The debt in 1891 was $1,610,620,103.

3. A man deposited in the bank $1840, and drew out by check the following amounts: $26.48, $134.18, $227.09, $6.94, $34.96, $87.45, $50. How much is left in the bank?

4. A merchant deposits in the bank April 1, $618.20, and on April 20 he deposits $217.40 more. He takes out at various times $723.60. What remains on deposit April 30?

5. On the first of January I had in the bank $346.20. On the 15th of January I put in $127.42. On the 31st of January I had in the bank $217.44. How much had I drawn out during the month?

6. In December the following deposits were made: $160.17, $230, $620.40, $46.30, $369.15, and during the same month the following amounts were withdrawn: $3.08, $25, $6.80, $6.72, $1.16, $6, $45.83, $7.23, $4.68, $1, $5, $20, $2.75, $4, $24.60, $1484.78. How did the account stand at the end of the month?

7. In 2½ lb. how many ounces? in 3¾ lb.?

8. How many yards in 8½ rd.?

9. How many feet are there in 4½ rd.?

10. What will 8½ gal. oil cost at 12½ ¢ a gallon?

11. What will 3⅓ pk. of peanuts cost at 6½ ¢ a quart?

12. In ⅔ of a rod how many feet?

1. How many half-pint tumblerfuls of milk in a gallon?

2. At $\$1\frac{1}{3}$ a yard, how much shall I pay for $8\frac{1}{2}$ yd. of cloth?

3. I have from the milkman three pints of milk daily. At 6¢ a quart, what will be my milk bill for the month of May? What will it be for the three winter months?

4. What is a bushel of potatoes worth at the rate of 5¢ a quart?

5. I can buy half a peck of apples for 15¢. At that rate, what should I pay for 3 bu.?

6. From a barrel of oil containing 35 gal., 15 gal. were used. What is the remainder worth at 18¢ a gallon?

7. A man bought 72 gal. of molasses at 42¢ a gallon. He sold $\frac{1}{3}$ of it at 48¢ a gallon, $\frac{1}{4}$ of it at 40¢ a gallon, and the rest at 43¢ a gallon. Did he make or lose, and how much?

8. If it takes 4.5 yd. to make an overcoat, how many overcoats can be made from 675 yd.?

9. I bought 6.8 tons of coal @ \$6.50 a ton, and paid for it in apples at 60¢ a bushel. How many bushels of apples did I give?

10. I give 132 doz. eggs, worth 26¢ a dozen, in part payment for 54 cords of wood at \$4.60 a cord. How much remains to be paid?

11. If it takes $18\frac{1}{2}$ yards of silk to make a dress, how many yards will it take to make 4 dresses? What will cloth enough to make 2 dresses cost at \$1.85 a yard?

1. A man can do a piece of work in 8 days, working 9 hours a day. How many days will it take him if he works 12 hours a day?

2. 6 men can build a wall in just 2 weeks. How many days will it take them if 2 men are added to their number?

3. If 20 men can make a road in 180 days, how many days would it take 60 men? 180 men? 10 men?

4. If 2½ lb. of butter costs 60¢, what will 8⅓ lb. cost?

5. What will 3.4 T. of coal cost at 35¢ per cwt.?

6. If I pay $5 for 2.5 yd. of cloth, what must I pay for .75 yd. of the same kind?

7. ⅔ of my farm is worth $2400. What is ½ of the rest of it worth?

8. A tailor makes a suit of clothes for $30. If the cloth for the suit costs $18, what is allowed for labor?

9. A man contracts to build a sewer for $2.10 a foot. The sewer pipe costs $1.25 a foot. What does he allow for labor and profit on 1 rd.? on 1 mi.?

10. If there are 150 pound packages of tacks in a box, what will be the freight on 12 boxes at 18¢ per cwt.? What will the tacks sell for at 7½¢ a pound?

11. If a man smokes 4 cigars a day, and they cost at the rate of 3 for a quarter of a dollar, what will his cigars for January cost? What for the entire year?

12. Frank earns $4.80 in a week. How much can he earn in 3 weeks and 3 days? How many days will it take him to earn $16.80?

13. How many paces each 2 ft. long will it take to walk 40 rods?

1. Mr. Brown's salary is $150 a month. How many years will it take him to earn $6000? If he saves $\frac{1}{8}$ of his salary, how long will it take him to save enough to buy a house worth $2500, and furniture worth $800?

2. How many paces each $2\frac{1}{2}$ ft. in length will one have to make to walk a mile?

3. The circumference of a wheel is 12 ft. How many times must it revolve in going 100 ft.? 1000 ft.? $\frac{3}{4}$ of a mile?

4. A tub of butter weighing 36 lb. 4 oz. lasted a family from May 14 to August 3. How many ounces a day on the average did they use?

5. A newsboy bought 3 doz. papers every day, paying $1\frac{1}{2}$ ¢ apiece for them. He sold them at 2 ¢ apiece. How much did he make between June 1 and September 20?

6. A man earns $1.75 every week-day, and his expenses are $8.50 a week. How many weeks will it take him to save $50?

7. If the 1st day of May is Thursday, what day of the week is the following 4th of July?

8. What is the difference between 6 dozen dozen and half a dozen dozen?

9. A workman receives $9.12 for $4\frac{3}{4}$ days' work, working 8 hours a day. How much an hour did he receive?

10. If I own half interest in a store and sell $\frac{3}{4}$ of my share for $840, what is the entire store worth?

11. How many years since the discovery of America?

12. How many years and months since the landing of the Pilgrims?

13. What is your age in years, months, and days?

1. How many years and months since the Declaration of Independence was signed?

2. How many times has the sun risen since the fourth day of last July?

3. A man worked from the 1st of May to the 1st of October, inclusive, at $2.25 for every week-day. There were in that time 21 Sundays. How much did he earn?

4. A tub of butter weighed 40 lb. 12 oz., the tub alone weighing 4 lb. 3 oz. What was the butter worth at 32¢ a pound?

5. The area of Lake Superior is 31,400 sq. mi.; of Lake Michigan, 25,600 sq. mi.; of Lake Huron, 23,800 sq. mi.; of Lake Erie, 1000 sq. mi.; and of Lake Ontario, 7300 sq. mi. How does the combined area of all the great lakes compare with the area of the Caspian Sea, which has an area of 132,000 sq. mi.?

6. The height of Mt. St. Elias is 17,900 ft.; of Pike's Peak, 14,147; of Mt. Washington, 6293 ft. How much higher is Mt. St. Elias than Pike's Peak?

7. I buy pass books at $5.04 a gross, and sell them at 5¢ apiece. What is the profit on 100 books?

8. How many rods long is a freight train of 36 cars, allowing 33 ft. for each car and a space of 2 ft. between the cars?

9. I pay for the yearly rent of a house .08 of its value. If the house is valued at $4500, what is the rent?

10. A horse trotted a distance of 18 miles in 2½ hours. How many miles an hour did he trot? How long did it take him to go a mile?

1. A man owns one house worth $4500 and another worth $6600. He receives as yearly rent of the first house .12 of its value, and of the second house .09 of its value. How much does he receive a month for both houses?

2. A train of cars started at 8.30 o'clock in the morning, and arrived at a point 300 miles away at 4 o'clock P. M. What was the average rate per hour? At the same rate, how long would it take the train to go from New York to Boston, a distance of 230 miles?

3. Pens which were bought for 80¢ a gross were sold at the rate of 6 for 5 cents. What was the profit on 6 gross?

4. The valuation of a certain town is $2,114,000. It raised for schools one year .04 of its valuation. What was the amount raised for schools?

5. What was the number of inhabitants to a square mile in your State in 1890? Name a State which had about the same number. (See table, page 20.)

6. Compare the number of inhabitants to a square mile in your State with that of Portugal; Italy; England. (See page 21.)

7. How many square feet of boards will it take to build a tight-board fence 6 ft. high around a rectangular lot of land 12 rd. long, 100 ft. wide?

8. How many pickets 3 in. wide, placed 3 in. apart, would it take to make the fence given in the last problem?

9. How many square yards in a pavement 200 ft. long and 6 ft. wide?

1. How many square feet of cloth will it take to cover the top of a desk 4 ft. 6 in. long and 3 ft. wide?

2. At 8½ ¢ a square foot, what will 10,000 square feet of land cost?

3. A piece of land in the form of a rectangle is 180 ft. long and 120 ft. wide. What is it worth at 15⅓ ¢ a square foot?

4. How many yards of fence will it take to inclose the above lot?

5. A boy counted the steps he took in walking around the Common, and found that he had taken 2868 steps. If his steps were 2 ft. long, how much more than a mile did he walk?

6. If that was the exact distance around the Common, how much would it cost to inclose it with a fence at the rate of 30 ¢ a yard?

7. A man walked ⅓ of a mile and back in 12 minutes. How long would it take him to walk a mile? 6¾ mi.?

8. The cotton crop of 1891 in the United States consisted of 8,655,518 bales. The average net weight per bale is 440 lb. How many tons were raised?

9. How many telegraph poles placed 60 yd. apart will be needed for wires to extend from Boston to New York, a distance of 230 miles?

10. If the silk that comes from one cocoon weighs 3½ grains, how many cocoons will it take to make five pounds of silk, no allowance for loss? Allowing that the length of the thread of a cocoon is 1800 ft., how many miles of thread will it take to make this quantity of silk? (1 pound = 7000 grains.)

Measures of Length.

12 inches (in.) = 1 foot (ft.)
3 feet = 1 yard (yd.)
5½ yards = 1 rod (rd.)
320 rods = 1 mile (mi.)

Measures of Surface.

144 square inches (sq. in.) = 1 square foot (sq. ft.)
9 square feet = 1 square yard (sq. yd.)

Liquid Measure.

4 gills (gi.) = 1 pint (pt.)
2 pints = 1 quart (qt.)
4 quarts = 1 gallon (gal.)

Dry Measure.

2 pints (pt.) = 1 quart (qt.)
8 quarts = 1 peck (pk.)
4 pecks = 1 bushel (bu.)

Avoirdupois Weight.

16 ounces (oz.) = 1 pound (lb.)
2000 lb. *or* 20 cwt. = 1 ton (T.)

Measure of Time.

60 seconds (sec.) = 1 minute (min.)
60 minutes = 1 hour (h.)
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